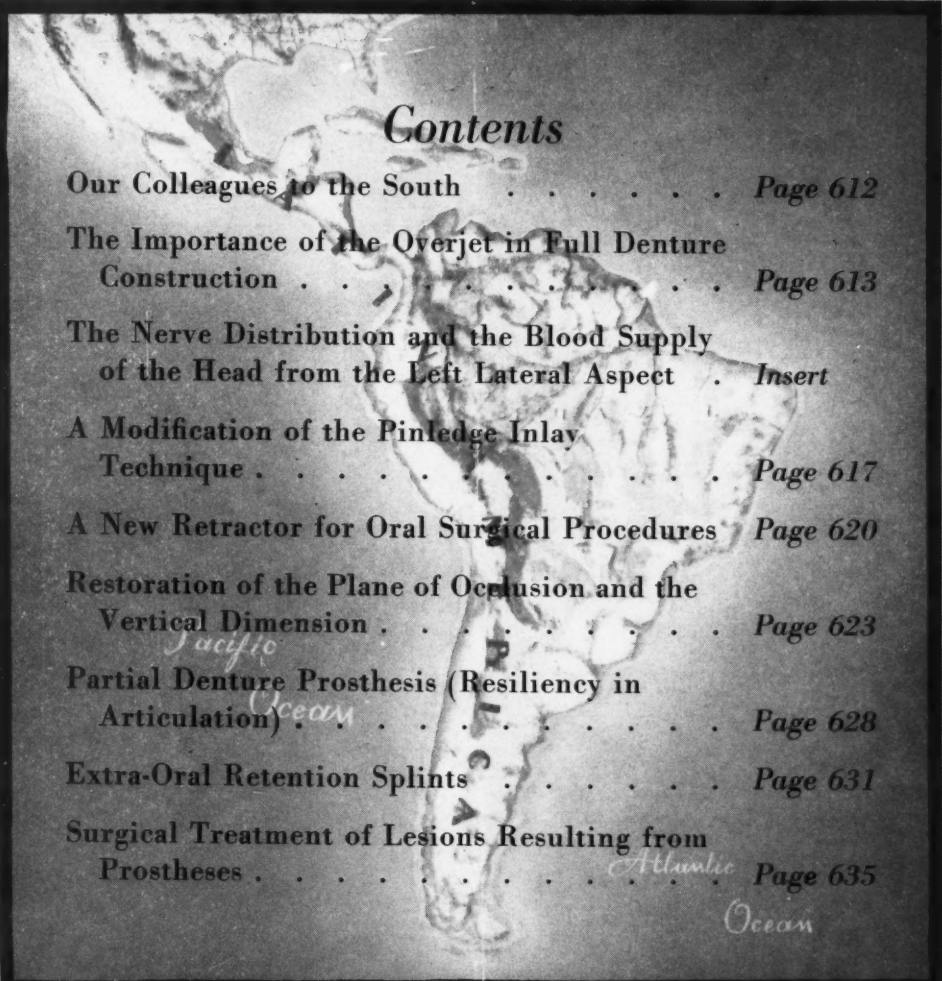
# DENTAL Digest




## Contents

Our Colleagues to the South . . . . . *Page 612*

The Importance of the Overjet in Full Denture Construction . . . . . *Page 613*

The Nerve Distribution and the Blood Supply of the Head from the Left Lateral Aspect . *Insert*

A Modification of the Pinledge Inlay Technique . . . . . *Page 617*

A New Retractor for Oral Surgical Procedures *Page 620*

Restoration of the Plane of Occlusion and the Vertical Dimension . . . . . *Page 623*

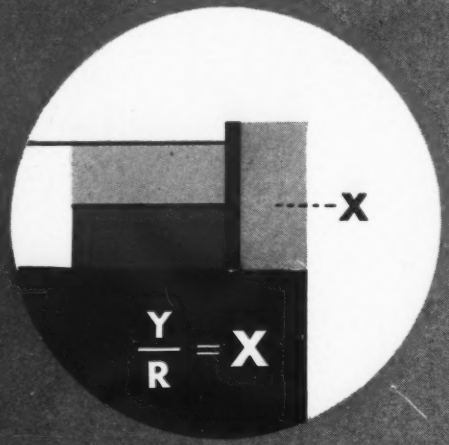
Partial Denture Prosthesis (Resiliency in Articulation) . . . . . *Page 628*

Extra-Oral Retention Splints . . . . . *Page 631*

Surgical Treatment of Lesions Resulting from Prostheses . . . . . *Page 635*

NOVEMBER 1945

BUY VICTORY BONDS

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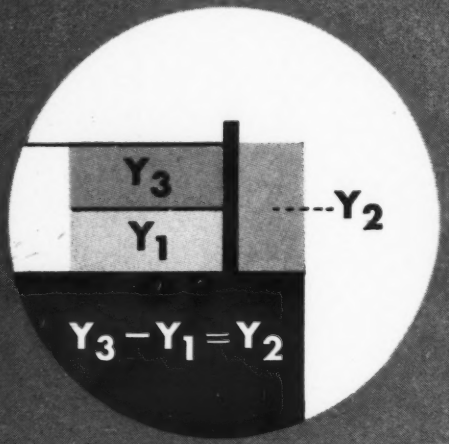


# USE THE YELLOW TO SEE THE RED · USE THE RED TO SEE THE YELLOW...

# USE THE LIGHT TO SEE THE DARK · USE THE DARK TO SEE THE LIGHT...

Human teeth are basically yellow or yellow modified with a tinge of red. The saturations of color, either the yellow or red, vary in each of these categories. The darker the tooth, the more intense the saturation and vice versa. The degree of saturation of even the "darkest" human tooth is very slight. Hence the difficulty in selecting tooth colors.

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THE DENTAL Digest

VOL. 51 NO. 11

## November 1945

Guest Editorial, Our Colleagues to the South, *Victor H. Sears, D.D.S.* ..... 612

The Importance of the Overjet in Full Denture Construction, *Guillermo A. Bizzozero, D.D.S.* ..... 613

The Nerve Distribution and the Blood Supply of the Head from the Left Lateral Aspect ..... Insert attached to page 617

A Modification of the Pinledge Inlay Technique, *Fernando E. Pinto, D.D.S.* ..... 617

Sharpening of Excavators and Chisels (An Abstract), *A. Dumont* ..... 619

A New Retractor for Oral Surgical Procedures, *Ubaldo A. Caorsi, D.D.S.* ..... 620

Restoration of the Plane of Occlusion and the Vertical Dimension ..... 623
*José María Quiroga, D.D.S.*

Factors in Recurrent Gingivitis (An Abstract), *K. McAllister, L.D.S.* ..... 627

Partial Denture Prosthesis (Resiliency in Articulation), *Roberto Harguindeguy, D.D.S.* ..... 628

Extra-Oral Retention Splints, *Leopoldo Panatt W., D.D.S.* ..... 631

Surgical Treatment of Oral Lesions Resulting from Prostheses, *Ricardo C. Guardo, D.D.S.* ..... 635

About Our Contributors ..... 639

The Editor's Page ..... 638 Contra-Angles ..... 646

Acrylic Resin as an Implant for Correction of Facial Deformities (An Abstract) ..... 656
*Kenneth W. Penhale, D.D.S., M.D.*

Significance of Dental Caries in Malocclusion (An Abstract), *Wade R. Plater, D.D.S.* ..... 663

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# *Our Colleagues to the South*

**VICTOR H. SEARS, D.D.S., Guest Editor**

WITH THE memory of the warm hospitality of the dentists of Latin America fresh in my mind, I returned to the United States from a four months' trip to Mexico, Central and South America. I brought with me a definite impression that Latin American dentistry is moving forward as never before. Whether dental progress in the United States has been retarded by the war, I cannot determine until after the national dental meetings are resumed. I do know that what we do in dentistry is being observed with the greatest interest in all the American republics.

It was my privilege to give clinics and lectures in Mexico, Guatemala, Costa Rica, Panama, Colombia, Peru, Chile, Argentina, Uruguay, Brazil, Venezuela, and Cuba. In these republics I found a large number of dentists who are a credit to their countries and their profession. I also met many dentists who are studying English for the purpose of visiting us and becoming acquainted with dentistry in the United States.

In some of the Latin American countries where most of the textbooks used were European, it took the war to cause a transfer of attention from Germany, France, and Spain to the United States. Fortunately, a transfer of attention is all that was needed, for the Latin American dentists are exceptionally open-minded. Indeed, open-mindedness, together with eagerness to learn the new, and willingness to abandon established procedures for more scientific ones, are outstanding characteristics in the American republics—characteristics which promise much for their rapid advancement.

It will come as a surprise to many that the best dental journal in the world devoted exclusively to prosthetic dentistry is published in South America. Three of the Latin American countries have completed the erection of dental college buildings which rival our best, and other similar buildings are under construction or past the blueprint stage. In some of the countries nearly fifty per cent of the dental students are women. Dental technicians are trained in dental colleges. In matters of advanced dental legislation we can look South for guidance.

Perhaps partly on account of restrictive trade rules in which our own government is as much to blame as theirs, they lack adequate equipment to give good service, especially in the prosthetic field. North American-made equipment is preferred in all the countries, but it is often almost impossible to obtain.

Some of the Latin American dentists speak several languages and many of them read enough English to enjoy our dental journals. In general they know more about us, in and out of dentistry, than we do about them. This issue of THE DENTAL DIGEST will help us to know them better. I wish here to express our appreciation to Doctor Guillermo A. Bizzozero for his efforts in gathering the material for this issue and to Doctor Gerardo Aste Salazar for the translations.

In a sense, this Latin American number is part of a journalistic exchange, because the June issue of *Prótesis* published in Buenos Aires presented articles exclusively by North American dentists. They are: Emmett Beckley, Kansas City; Carl O. Boucher, Columbus; Robert R. Gillis, Hammond, Indiana; Elam Harris, Louisville; Melvin E. Page, St. Petersburg, Florida; F. Ewing Roach, Chicago; Victor L. Steffel, Columbus; Walter H. Wright, Pittsburgh; and Louis S. Block, Louisville.

Dentistry will make more rapid progress and we can add more new friends by closer cooperation with our colleagues south of the Rio Grande.

# *The Importance of the Overjet In Full Denture Construction*

**GUILLERMO A. BIZZOZERO, D.D.S., Buenos Aires, Argentina**

***The normal horizontal prominence of the upper teeth over the lowers, the overjet, is emphasized in full denture construction. For a clearer explanation of its importance, the dental arches are divided into three segments, and the esthetic, functional, and mechanical aspects of each segment are discussed.***

THE NORMAL prominence of the upper teeth over the lowers, with reference to the horizontal plane, is called *overjet* or *horizontal overbite. Overjet* must be differentiated from *vertical overbite* which is the normal prominence of the upper teeth downward in front of the lower teeth in the vertical plane. The horizontal prominence of the vestibular surfaces of the posterior teeth and of the labial surfaces of the anteriors is of great importance. This relationship must be understood thoroughly in making successful full dentures, especially if anatomic teeth are used.

To get a better understanding of the dental arches, they are divided into three segments: one anterior segment, from cuspid to cuspid, and the two posterior segments. The esthetic, functional, and mechanical aspects of each segment also are discussed.

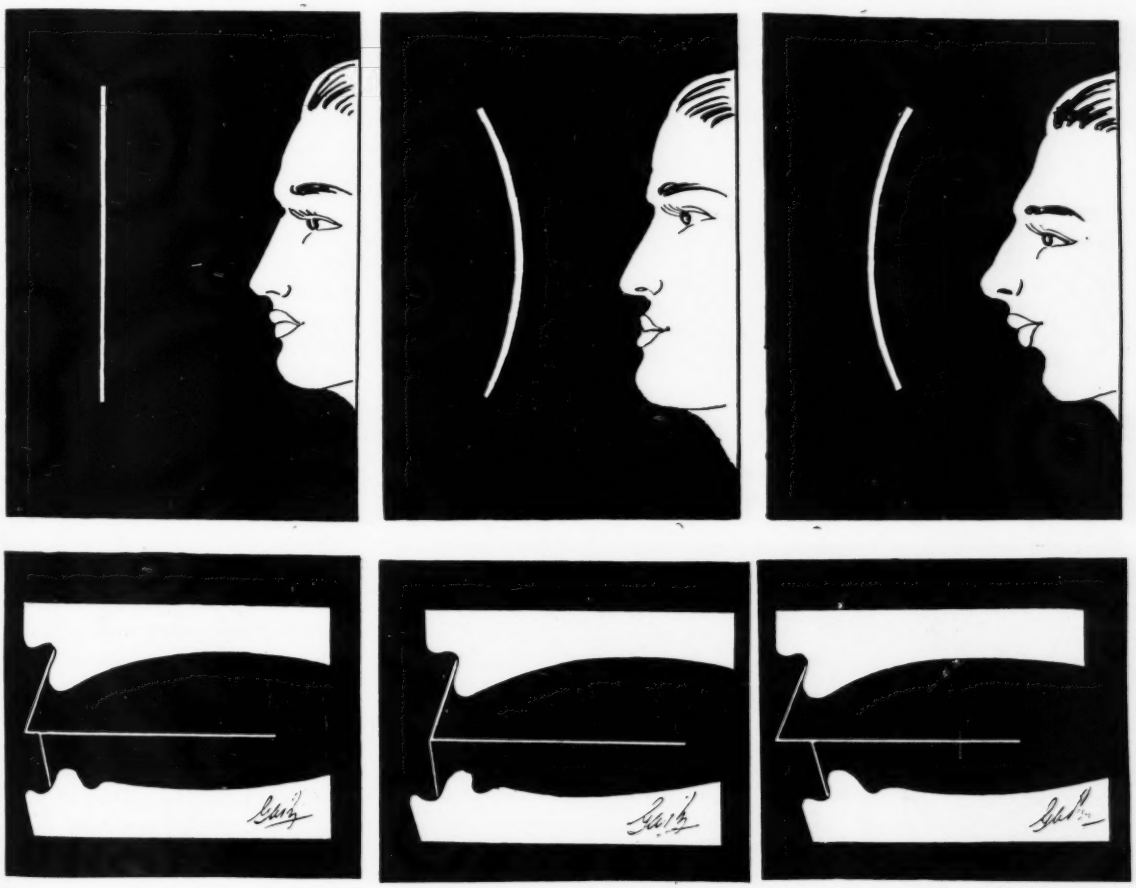


*Fig. 1A* *Fig. 1B* *Fig. 1C*

*Fig. 1—The relationship between the different types of profiles and the alveolar ridges: (A) Straight profile which requires a normal overjet, as is indicated in the lower sketch. (B) Concave profile which prevents arranging the teeth in overjet because of the relationship of the ridges. In some difficult cases the articulation of the teeth must be inverted. (C) Convex profile which necessitates a great overjet of the dentures, in some cases 12 millimeters.*

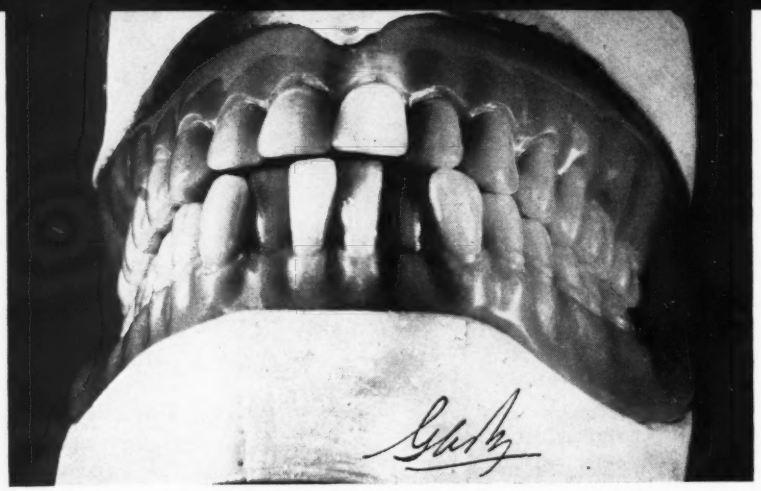


*Fig. 2—Dentures in centric occlusion with a normal relationship of the alveolar ridges (A in Fig. 1); always requires an overjet of at least 1 millimeter.*

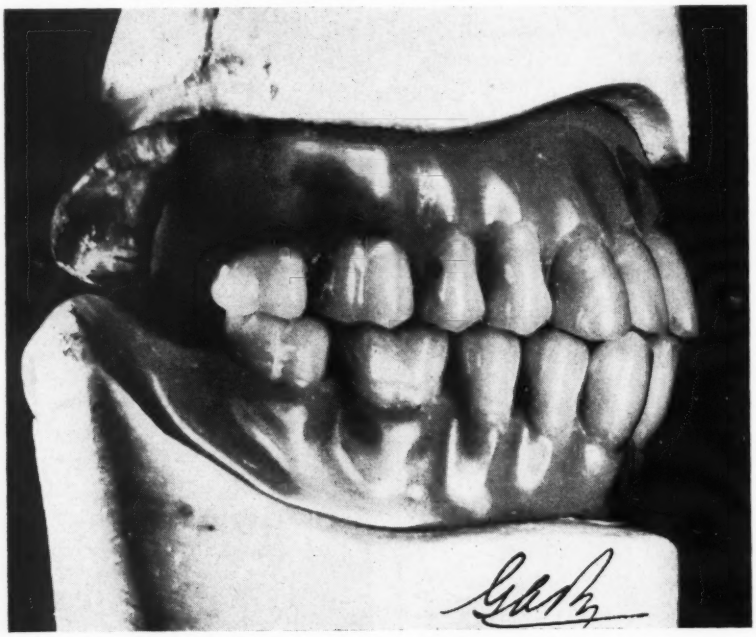


*Fig. 3—Side view of case shown in Figure 2.*

*Fig. 4—Case in which the overjet is greater as a result of the relationship of the alveolar ridges (C in Fig. 1).*

## Anterior Segment

*Esthetic Aspect*—The occlusal rims are to be considered first in the determination of the anterior overjet. The anterior part of the upper and lower occlusal rims are shaped at the same time that the vertical dimension is established, adding or taking off material and re-establishing the necessary support to improve the esthetics of the lips and to restore their natural appearance.

The amount of material that must be added to the upper occlusal rim to restore the lip and profile to their correct and normal position determines the extent of separation of both rims in the horizontal plane, or, in other words, the amount of overjet (Fig. 1). This fact must be kept in mind when setting up the teeth in order to produce exactly the overjet that is necessary.

*Functional Aspect*—It is an established rule that the upper anterior teeth must not be in contact with the lower anteriors when the dentures are in centric occlusion. This rule should be observed to prevent the continuous traumatic occlusal stress that causes a resorption of the anterior ridge, which often is seen in patients with dentures. When the dentures are in centric occlusion, there must be a separation, or overjet, of at least 1 millimeter (Figs. 2, 3, 4, and 5). As was mentioned, the extent of separation depends on the type of profile. The exception to this is in the case of protrusion of the mandible, where it would be impossible to establish an overjet.

*Mechanical Aspect*—If no overjet is established in the anterior segment, incisal biting will be difficult or impossible. For a better understanding of this point, reference is made to the four steps of the masticatory cycle:

1. Depression movement.
2. Protrusion of the mandible, in which the mandible is slid downward and forward until the incisal edges of the upper and lower anteriors are in an incising relationship (sometimes with slight lateral movement).
3. The teeth in an edge-to-edge-contact.

*Fig. 5—Side view of case shown in Figure 4.*

*Fig. 6—Correct position of the teeth to prevent biting of the cheeks and tongue and to produce proper balance. This arrangement makes unnecessary the use of excess base material for esthetics.*

*Fig. 7—The relationship of the cheeks and tongue in a denture made without overjet of the posterior segments. Consequently the cheeks and tongue are bitten easily.*

4. Back to the initial position, cutting in an incising movement, the incisal edges of the lowers being carried against the lingual surfaces of the upper teeth.

Consequently balance in protrusion is produced when the incisal edges of the anteriors and the occlusal surfaces of the posteriors are in contact. Some prosthodontists believe that even in incisal biting there should be no contact of the anteriors, but that the space should be no larger than to permit the passage of a celluloid strip.

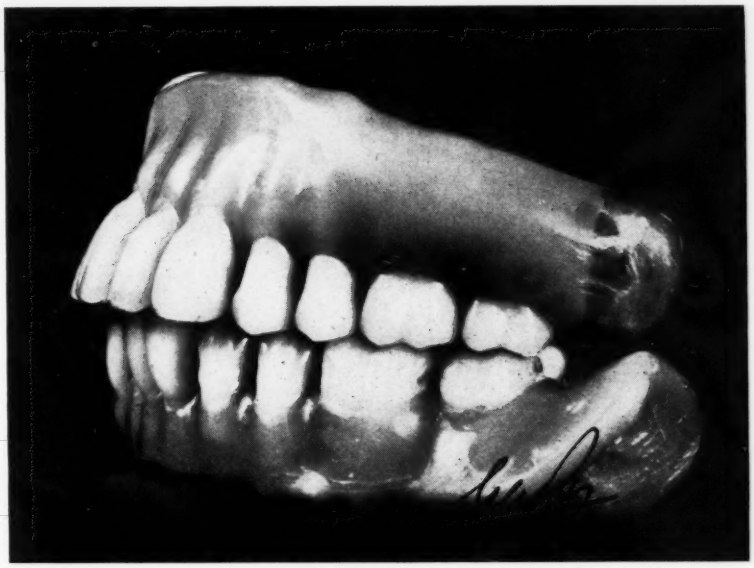


*Fig. 5*

## Posterior Segment

*Functional Aspect*—Overjet is necessary in the posterior segments to prevent biting of the cheeks or the tongue (Fig. 6). If there is cheek biting, round off the lower buccal cusps; or if there is tongue biting, round off the upper lingual cusps (Fig. 7).

*Mechanical Aspect*—The mechanical aspect of full denture construction could be called the "key to balanced articulation" when anatomic teeth

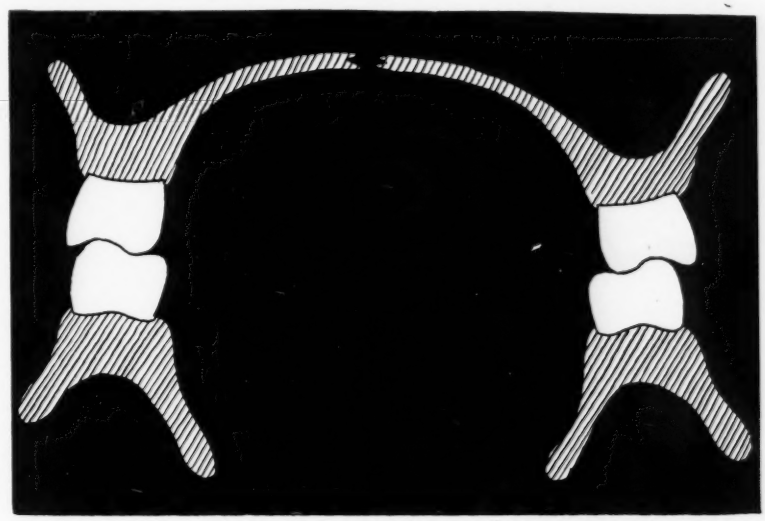


*Fig. 6*

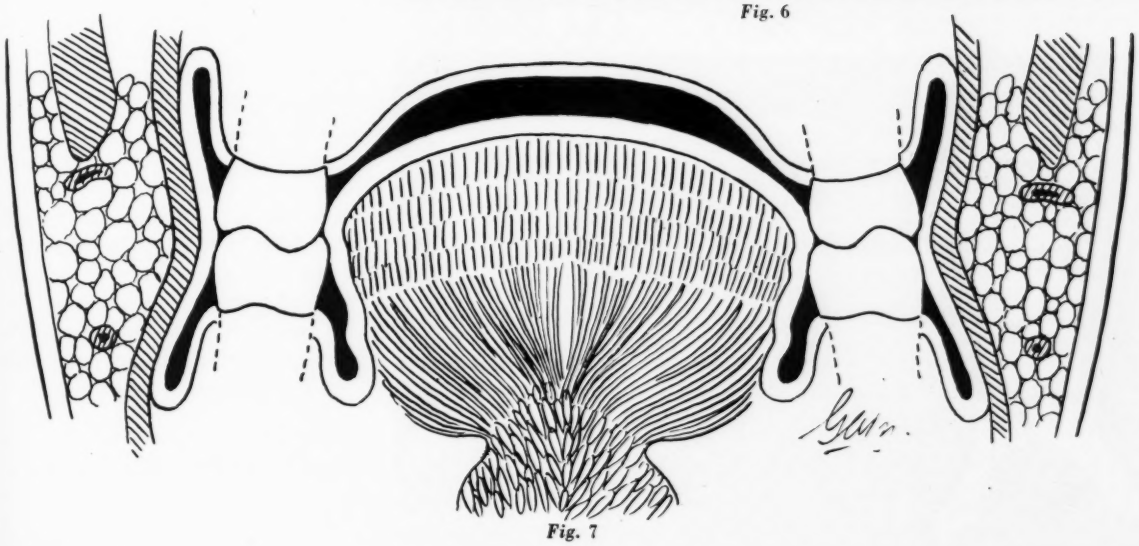


*Fig. 7*

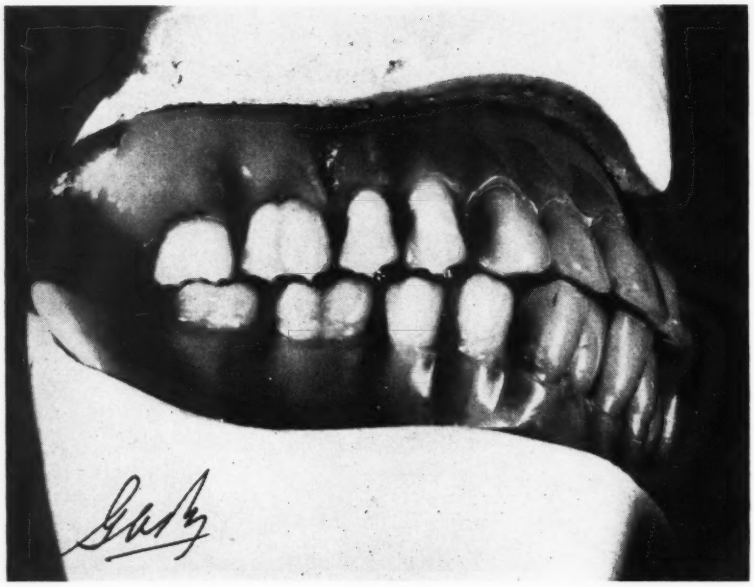


*Fig.* 8

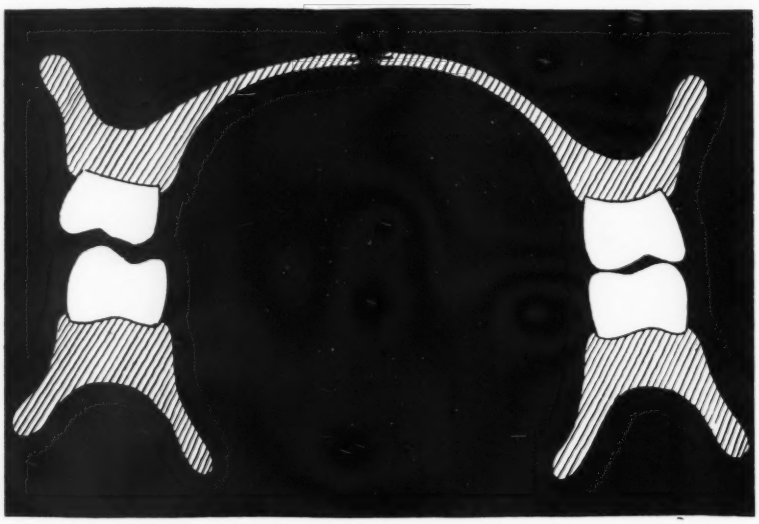


*Fig.* 9

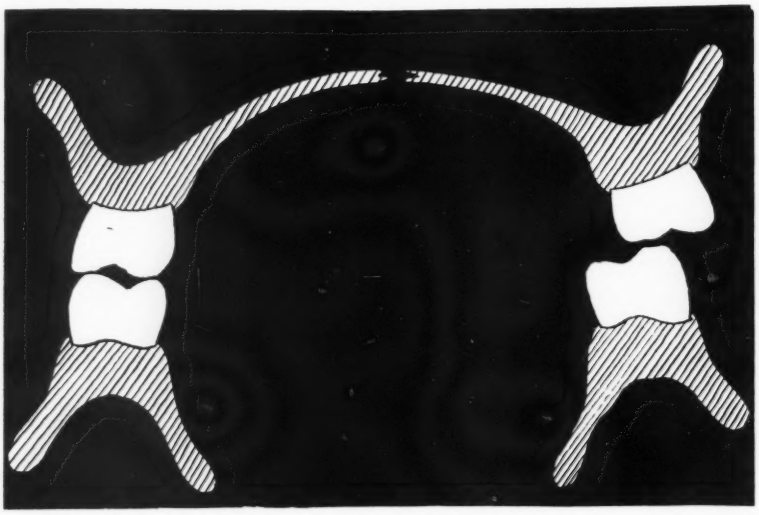


*Fig.* 10

*Fig. 8—Correct overjet of the bicuspids and molars. Note how the overjet increases from the back forward according to the functional extent of the bite.*

*Fig. 9—Incorrect arrangement of the upper and lower posterior segments which prevents proper balance of the dentures.*

*Fig. 10—Correct arrangement of the posterior segments for balance of the dentures.*

are used. It is impossible to balance a denture if the teeth have not been arranged with a correct overjet (Fig. 6). The overjet must increase proportionally from the back forward according to what is called the "functional extent of the bite," the necessary amount of displacement of the lower arch in a lateral movement to meet the cusps in a functional relationship (Fig. 8).

The purpose of increasing the overjet from the back forward is so that the cusps of the upper and lower bicuspids, to meet in the same vertical plane, will have to cover a greater distance than the cusps of the molars. If this is not done it is impossible to obtain the articulation balance of the dentures. In performing lateral movement in mastication, the mandible slides far enough toward the functioning side that the corresponding buccal and lingual cusps will meet. The opposite side of the mandible slides the same distance, but if there is not sufficient overjet the upper cusps will not meet the lower cusps and the buccal cusps of the lowers will oppose the sulci of the uppers (Fig. 9). Consequently there will not be balance of the dentures. If the overjet is adequate, there will be contact of the lower buccal cusps with the upper lingual cusps on the balancing side. This detail, in balancing the anatomic teeth (Fig. 10), must be observed.

*Esthetic Aspect*—With the proper recognition of the importance of the overjet, it is unnecessary in the majority of cases to use an excess of base material in the upper denture border to develop the proper facial form and contour.

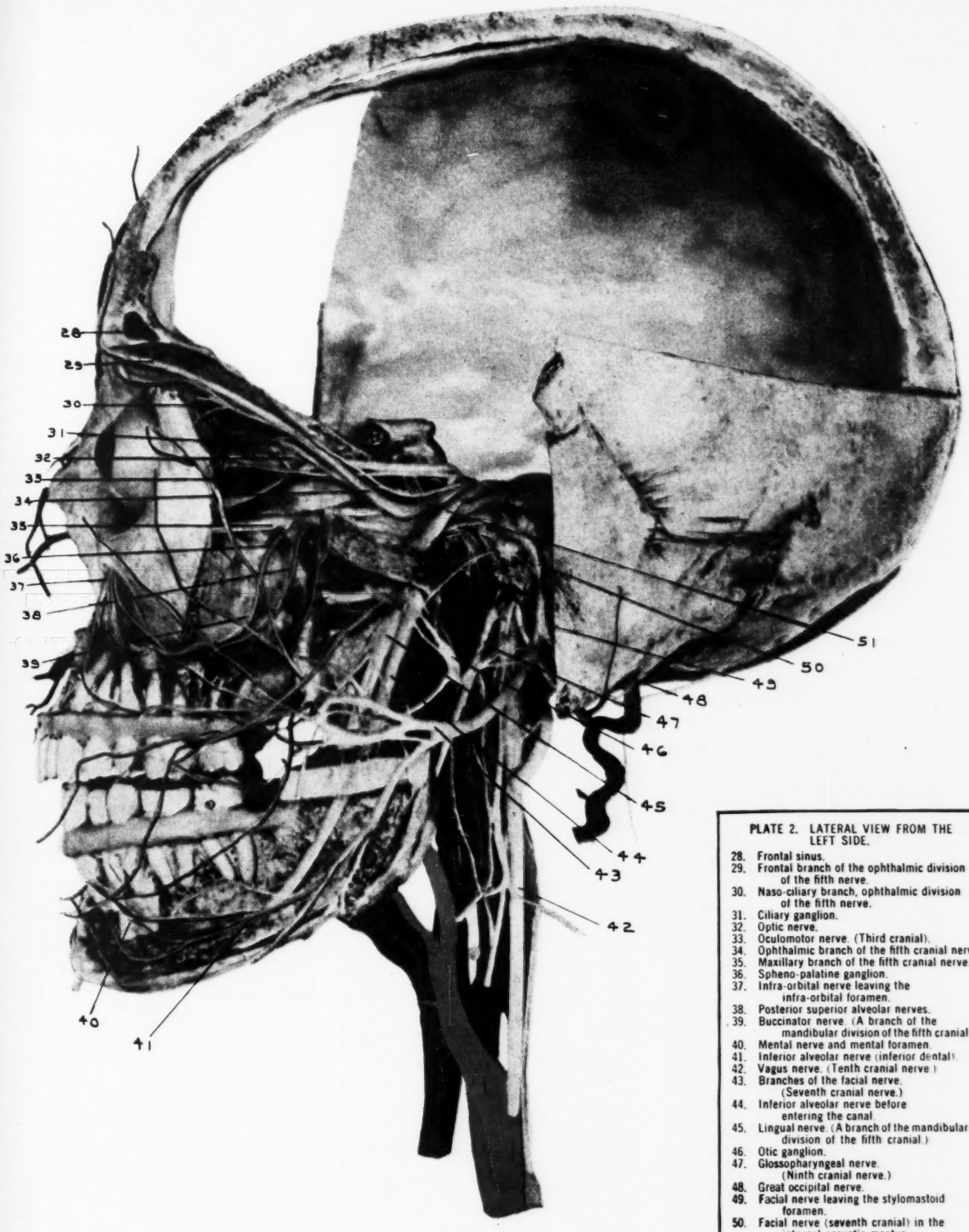



PLATE 2. LATERAL VIEW FROM THE LEFT SIDE.

28. Frontal sinus.
29. Frontal branch of the ophthalmic division of the fifth nerve.
30. Naso-ciliary branch, ophthalmic division of the fifth nerve.
31. Ciliary ganglion.
32. Optic nerve.
33. Oculomotor nerve. (Third cranial).
34. Ophthalmic branch of the fifth cranial nerve.
35. Maxillary branch of the fifth cranial nerve.
36. Spheno-palatine ganglion.
37. Infra-orbital nerve leaving the infra-orbital foramen.
38. Posterior superior alveolar nerves.
39. Buccinator nerve. (A branch of the mandibular division of the fifth cranial.)
40. Mental nerve and mental foramen.
41. Inferior alveolar nerve (inferior dental).
42. Vagus nerve. (Tenth cranial nerve.)
43. Branches of the facial nerve. (Seventh cranial nerve.)
44. Inferior alveolar nerve before entering the canal.
45. Lingual nerve. (A branch of the mandibular division of the fifth cranial.)
46. Otic ganglion.
47. Glossopharyngeal nerve. (Ninth cranial nerve.)
48. Great occipital nerve.
49. Facial nerve leaving the stylomastoid foramen.
50. Facial nerve (seventh cranial) in the internal acoustic meatus
51. Gasserian or semilunar ganglion.

# *The Nerve Distribution and the Blood Supply of the Head From the Left Lateral Aspect*

*Explanatory Note:*

This is the second plate in a series of anatomic charts in full color. The final chart will appear in the December issue.

# *A Modification of the Pinledge Inlay Technique*

**FERNANDO E. PINTO, D.D.S., Buenos Aires, Argentina**

***Procedures are suggested for eliminating the common difficulties encountered in the construction of the pinledge inlay, and a modification to simplify the usual technique is described.***

THE PINLEDGE inlay has been used when indicated in partial prostheses and in the stabilization of loose teeth in case of a periodontal disturbance. Its mechanical and esthetic values and the fact that it is not injurious to the pulp are sufficient reasons to justify its application. Because of difficulties in its construction, however, many practitioners rarely have used the pinledge inlay. These difficulties can be remedied with practice and a careful technique. That its construction is a tedious task even for the specialist is acknowledged, however. For this reason it was thought useful to try some modifications to simplify the technique. In this article, which points out the chief inconveniences of the common techniques, procedures are suggested for eliminating the inconveniences and a modified technique is described.

## Difficulties Encountered

In addition to the difficulties encountered in making any metallic inlay, the first to arise in the construction of the pinledge inlay is in centering the hole for the pin in the ledge and in obtaining parallelism of all the holes without injuring the pulp. This difficulty could be avoided only if the end of the bur were rested on the axial surface of the ledge and the perforation were made in the exact center of it. To assure parallelism of the holes and to prevent injury of the pulp it is necessary to remember the location of the pulp, to have clear vision of the tooth, and to correct the position of the patient so that the operator can work conveniently and comfortably. The bur should be placed parallel with the long axis of the tooth and the holes made one after the other.

Another difficulty that has been encountered during the development of the technique is in placing the pins (iridioplatinum wire) in the holes either to take an impression or to get a direct wax pattern. The pins are so

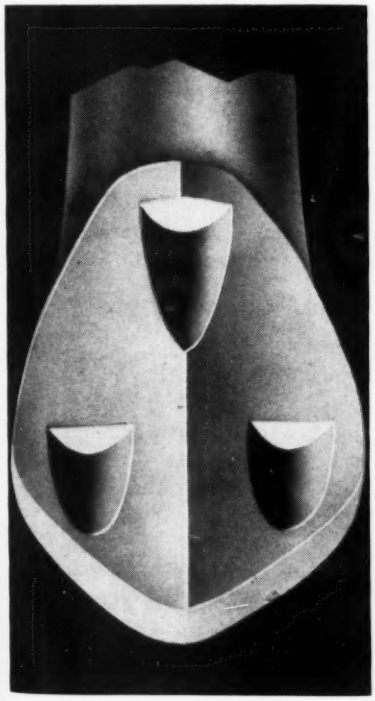


*Fig. 1—The tooth prepared and the ledges cut in the usual manner.*

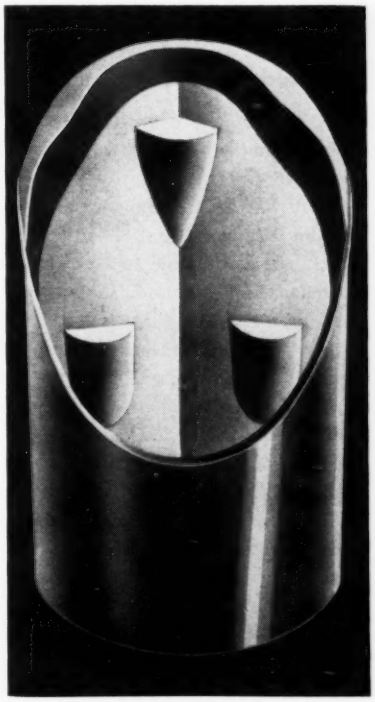


*Fig. 2—The wax impression of the preparation.*

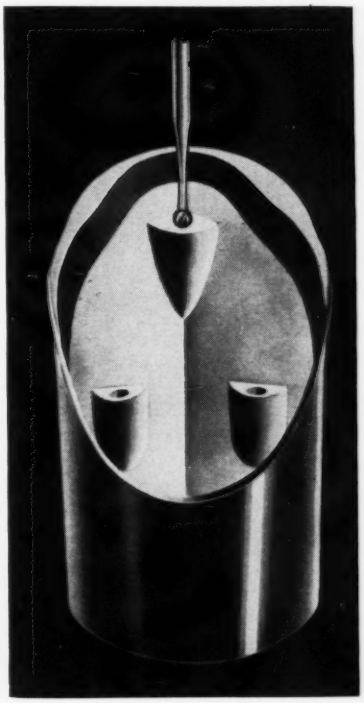


*Fig. 3—A perpendicular hole is made in the center of each ledge.*

small that it has been difficult to carry them into the mouth. If the holes were too large there was the possibility of dropping the pins from the preparation, or if the holes were too small there was the possibility of leaving the pins in the preparation when the impression or wax pattern was removed. To overcome these disadvantages some practitioners have substituted cast pins for those of iridioplatinum wire. Cast pins are made at the same time as the entire inlay. In this case it is necessary to make the holes of a flared or conic shape to facilitate the withdrawal of the impression and to increase the strength of the pins. This necessitates cutting away much of the tooth structure and decreases the retention of the inlay. A better method to prevent these difficulties is to make the pins of iridioplatinum wire, have the pins fit tight into the holes without having to force them in, carry the pins into the mouth with tweezers, and keep them in place by means of a little vaseline at the end of the pin in contact with the floor of the hole.

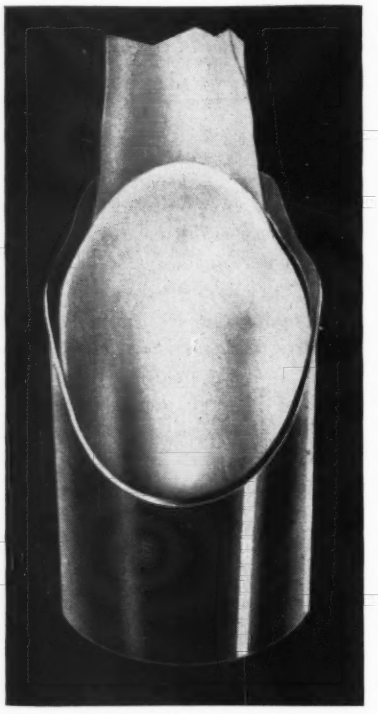


*Fig. 4—The impression replaced on the tooth to check for distortion.*

*Fig. 5—A carbon point, same diameter as the bur, placed in each hole.*

If the indirect method is used and a compound impression is taken to get an amalgam die or a copper die by galvanoplasty, the difficulties encountered can be overcome. This procedure can be simplified by pouring the impression in investment.

## Modified Technique

1. The tooth preparation and cutting of the ledges follow the usual technique (Fig. 1).

2. A wax impression of the preparation is taken (Fig. 2). (Instead of taking the impression in wax, it can be taken in compound. In this case the perforations subsequently described are not made in the impression. An amalgam die or a copper die is made by galvanoplasty, and holes are centered in the ledges in the die. Carbon points are placed in each hole and then the wax pattern is made.)

3. Using a round bur, 0.5 millimeters in diameter, a perpendicular hole is made in the center of each ledge in the wax impression (Fig. 3). The holes should be parallel to each other, and should be 3 to 4 millimeters deep depending on the size of the ledge.

4. Replace the impression on the tooth to check for any distortion of the wax (Fig. 4).

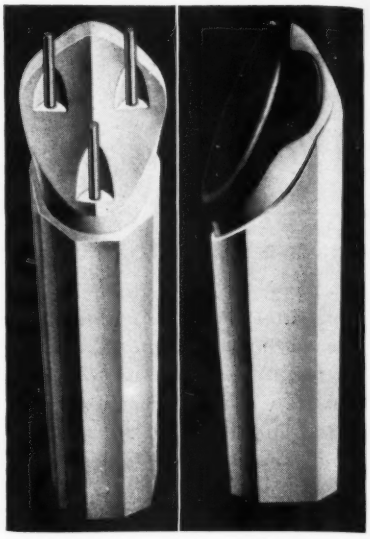


*Fig. 6* *Fig. 7*

*Fig. 6—The investment die with the carbon points in place in the holes.*
*Fig. 7—The wax pattern with labial extensions.*

5. Place a carbon point, of the same diameter as the bur, in each hole in the wax impression (Fig. 5).

6. Pour the impression in investment, and make a die. Figure 6 shows the carbon points in place in the holes in the ledges of the die.

7. Make a wax pattern as usual, bringing extensions of the wax toward the labial (Fig. 7). The labial extensions will increase the retention of the inlay.

8. Cast. Remove the carbon points and complete the perforations, extending them through the inlay (Fig. 8).

9. Place the inlay on the tooth preparation (A in Fig. 9). Pass a round bur through the holes of the inlay to the center of the ledges (B in Fig. 9). Using a carborundum disc, make a notch on the bur to act as a guide for the depth of the holes; usually 2 millimeters is adequate. The canals of the inlay will guide the direction of the bur into the tooth and assure parallelism of the holes. Be sure that the notch does not pass beyond the entrance of the canals in the inlay so that the perforation will not extend too deep into the tooth.

10. Insert a piece of iridioplati-

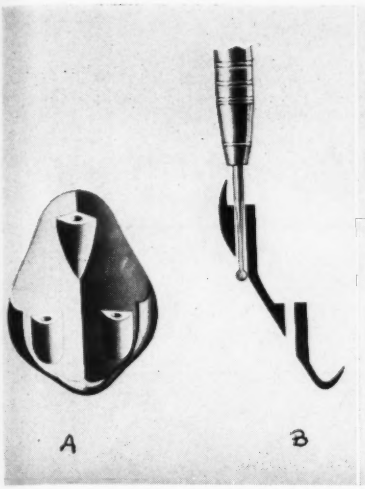



*Fig.* 8

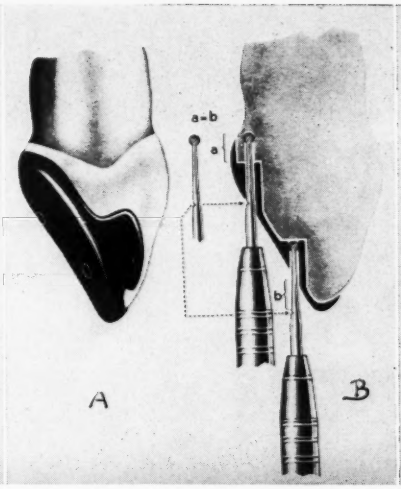



*Fig.* 9

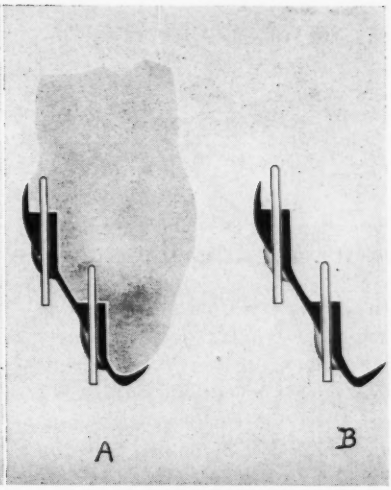



*Fig.* 10

*Fig.* 8—(A) *The casting.* (B) *Correction of the perforations.*
*Fig.* 9—(A) *The inlay in place.* (B) *Making the pin holes in the tooth: The inlay perforations guide the bur into the tooth and assure parallelism of the holes. The notch on the bur determines the depth of the holes.*
*Fig.* 10—(A) *The iridioplatinum pins in place and secured with wax.* (B) *The inlays and pins intact, ready for investment and soldering.*

num wire through each hole of the inlay and into the holes in the tooth, and secure the wires to the inlay with wax (A in Fig. 10). Remove the inlay and the pins intact from the tooth (B in Fig. 10).

11. Invest and solder. Cut off the labial extensions shown in Figure 7 and the excess pin extensions. The inlay will then be finished.

*Diaz Velez* 4075.

# *Sharpening of Excavators and Chisels*

**A. DUMONT**

Most practitioners do not take time to sharpen their instruments. The three reasons for this are:

1. Ignorance of the advantages of the use of cutting instruments over the use of burs.
2. Lack of a practical sharpening technique.
3. Ignorance of a good way to test the cutting edge.

### Advantages of Cutting Instruments Over Burs

1. Precision.
2. Cleanliness.
3. Rapidity.
4. Less effort required.
5. Economy of instruments.
6. Security.
7. Less painful.

### Technique of Sharpening

*Theory*—1. An edge is a line formed by the intersection of two surfaces (Fig. 1).

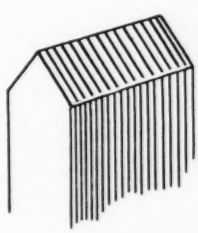


*Fig.* 1

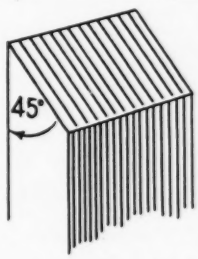



*Fig.* 3

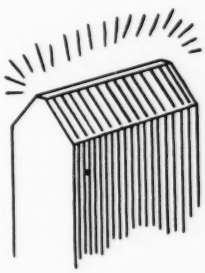


*Fig.* 2

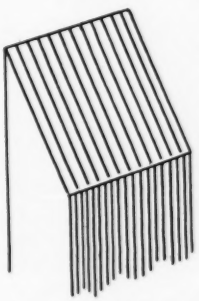


*Fig.* 4

2. An edge is blunt when this line

(*Continued on page* 630)

# *A New Retractor for Oral Surgical Procedures*

**UBALDO A. CAORSI, D.D.S., Buenos Aires, Argentina**

***An original automatic retractor for use in oral surgical procedures is presented. One advantage of this adjustable appliance, which includes a head band and attachable retractors of various types, is that it can be used in all operations on the maxilla and the mandible.***

IN ORAL surgery and maxillary sinus surgery it usually is necessary for the operator to work with an assistant either to hold the retractors when the incision is made or to hold the flap in the required position. The instrument that is presented here, the "automatic retractor," virtually eliminates the necessity of having an assistant. This instrument can be used in any kind of operation on the maxilla and the mandible. The obvious advantages in using the automatic retractor are:

1. It can be adjusted to the case

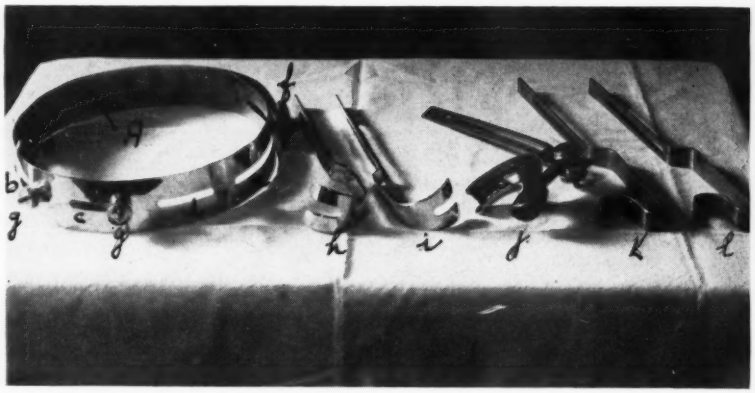


*Fig. 1—Parts of the automatic retractor: (A) flexible metallic band; (a, b, c, and d) elliptical perforations; (e) larger elliptical perforation for adjusting the head band; (f) screw to tighten the head band; (g and g') screws to hold the retractors; (h and i) retractors for the upper lip; (j) retractor for the cheeks; (k and l) retractors for the lower lip.*

*Fig. 2—The automatic retractor in position, showing the retractors of the upper lip (h and i in Fig. 1) in use in an alveolectomy of the anterior segment of the maxilla.*

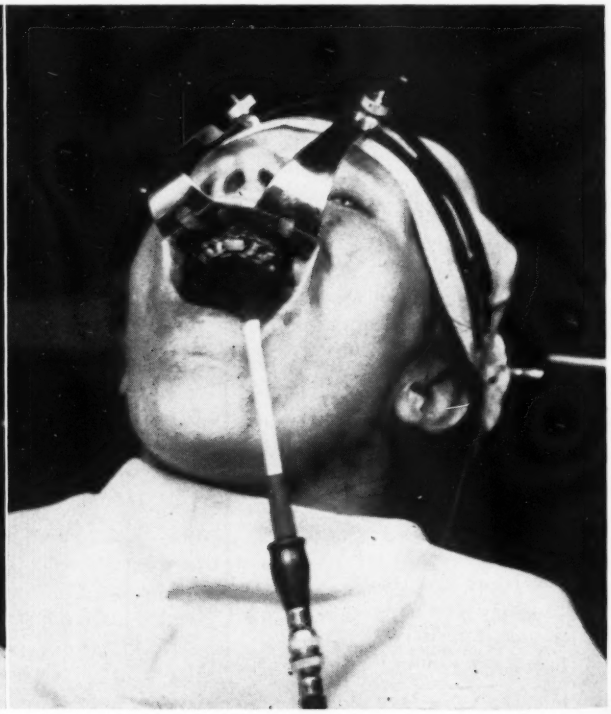


*Fig. 3—The same case as Figure 2 after the incision has been made and the periosteotomy performed. The retractors h and i (Fig. 1) hold the flap.*

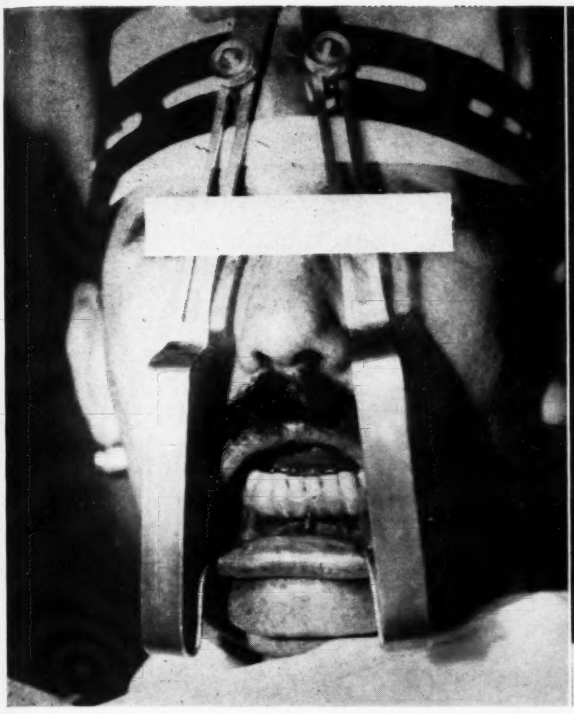


*Fig. 4—The retractors k and l (Fig. 1) hold back the lower lip in an operation on the anterior mandible. Note the great visibility of the operating field.*

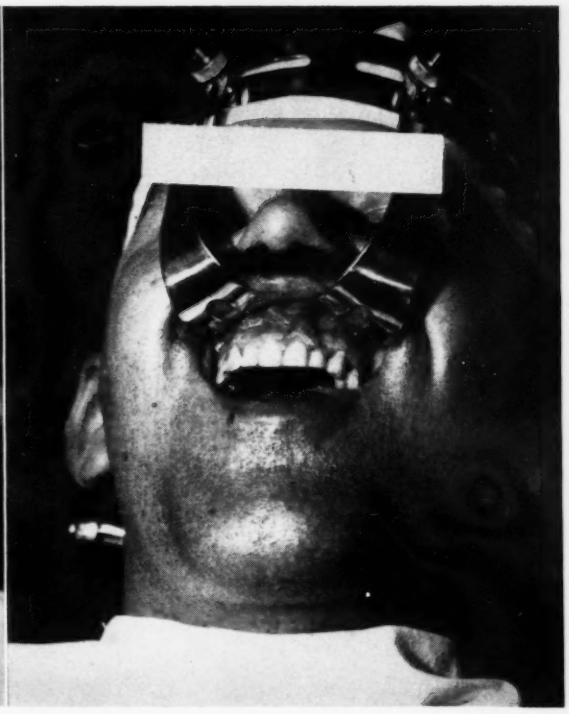


*Fig. 5—Patient ready for apicoectomy, retractors h and i (Fig. 1) being used.*

on hand, producing a constant and uniform force.

2. The secondary edemas which result from the continuous unequal traction produced when the retractor is held by an assistant are less marked when the automatic retractor is used.

3. The field of vision of the operator is not obstructed by the assistant.

## Description of Appliance

The parts of the automatic retractor are shown in Figure 1. The head band (A in Fig. 1), a flexible metallic band, has four elliptical perforations, each 40 millimeters long and 5 millimeters wide, placed horizontally and symmetrically on each side of the midline (a, b, c, and d in Fig. 1). Another perforation of the same shape but larger (e in Fig. 1) is made at one end of the head band to adjust the band to the patient's head by means of a screw soldered to the opposite end of the band and adjusted with a nut (f in Fig. 1). In each perforation there is a screw (g and g′ in Fig. 1) to hold the stem of the retractor.

The other parts of the appliance are the various retractors (h, i, j, k, and l in Fig. 1) which are attached to the headband to hold back the lips and cheeks and the tissue flaps during an operation.

## Use of the Appliance

1. Figure 2 shows the appliance in place for an alveolectomy of the anterior segment of the maxilla. The head band is placed on the patient's head with the screws (g and g′ in Fig. 1) over the forehead to hold the retractors (h and i in Fig. 1) in place for pulling the upper lip to the position desired. Anesthesia is administered previous to application of the retractors. After the incision has been made and the periosteotomy performed, the flap is held back by the same retractors (Fig. 3). The operation then can be performed with comfort.

2. Figure 4 shows the retractors in use in an operation (cystectomy, gingivectomy, or alveolectomy) of the anterior part of the mandible. Retractors k and l (Fig. 1) are being used to hold back the lower lip.

3. Figure 5 shows a patient ready for an apicoectomy. The same clamps that were used in the operation shown in Figures 2 and 3 are used here.

4. The retractors j and h (Fig. 1) are used for a maxillary sinus operation (Fig. 6). The retractor j holds back the cheek and part of the upper lip; the retractor h enlarges the operating field and holds back the flap.

5. In removing an impacted lower third molar and in gingivectomy, cystectomy, and other procedures in the lower bicuspid and molar regions (Fig. 7), the retractor j in Figure 1 is used.

6. It is advisable to place a sterile cap on the patient's head when the automatic retractor is used so that it can be adjusted whenever necessary during the operation without contaminating the wound and to add to the comfort of the patient.

## Advantages of Automatic Retractor

1. An assistant is not required during the operation.

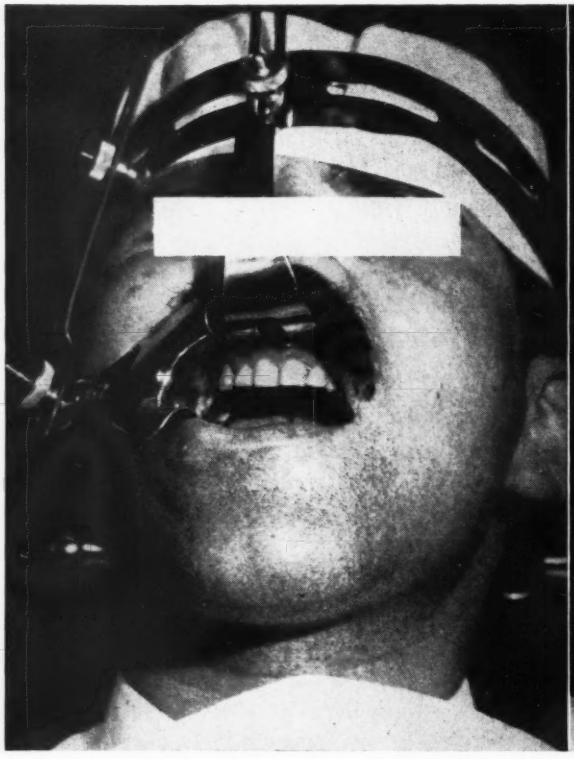


*Fig. 6—The retractors j and h (Fig. 1) are being used in an operation of the maxillary sinus.*

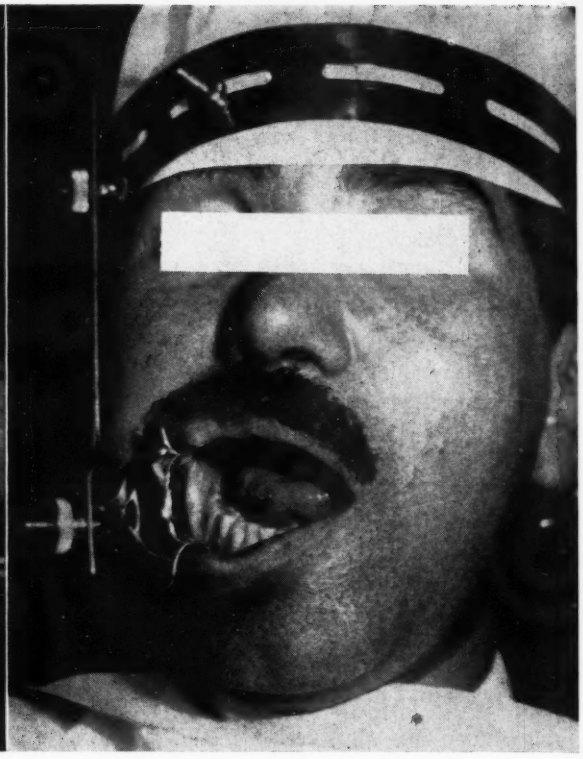


*Fig. 7—The bicuspid and molar regions are exposed by means of retractor j (Fig. 1).*

2. The field of vision is not obstructed by an assistant.
3. The retractor provides a larger operating field.
4. The operating field stays immobile and the visibility is uniform.
5. The postoperative edema is less marked.
6. The retractor is easily sterilized.
7. The retractor is easy to handle.

## *Editor's Note*

AN EXCELLENT article, A FLEXIBLE REST IN THE REMOVABLE PARTIAL DENTURE, by Virgilio Moojen de Oliveira, D.D.S., M.D., Avenida Rio Branco 311-6, Rio de Janeiro, Brazil, was received in the editorial office of this magazine. The illustrations were lost in the mail between the editorial office and the office of the art director. If this material is recovered later, the article will be published in a subsequent issue.

## *Clinical and Laboratory Suggestions*

THIS DEPARTMENT will be resumed in the December issue of THE DENTAL DIGEST. Readers are urged to continue submitting their practical suggestions, using the form on page 644 of this issue.

# *Restoration of the Plane of Occlusion and the Vertical Dimension*

**JOSÉ MARÍA QUIROGA, D.D.S., Buenos Aires, Argentina**

***The symptoms associated with malocclusion and loss of vertical dimension are listed as an aid to proper diagnosis, and the importance of correcting both conditions physiologically and esthetically is discussed. Illustrated cases show the use of removable appliances in restoring normal occlusion and vertical dimension.***

MASTICATION, which is reserved for the teeth, is of greatest importance for proper digestive functioning. We, the dentists, should be the first to realize its importance and should take care that it is developed within the best mechanical and physiologic norms. Inasmuch as the effectiveness of mastication depends on the plane of occlusion, its integrity should be established rigorously. The interdigitation of the teeth and the occlusal balance must be restored whenever possible. They are equally as important as the restoration of dental tissue.

A lack of freedom of movement on the plane of occlusion or an abnormal occlusal relationship of the arches, as are seen in open bite cases, are destructive to the tooth structures and to the supporting tissue. If there is no overjet the bite is locked, preventing the free sliding of the teeth and causing continuous trauma. Some such cases can be corrected by grinding the involved teeth. An extreme overbite means a loss of vertical dimension, frequently due to an underdevelopment of the posterior teeth which compels the condyle to undergo extra movement, thus removing it from its resting position. This results in disturbances of the delicate neighboring tissues and organs.

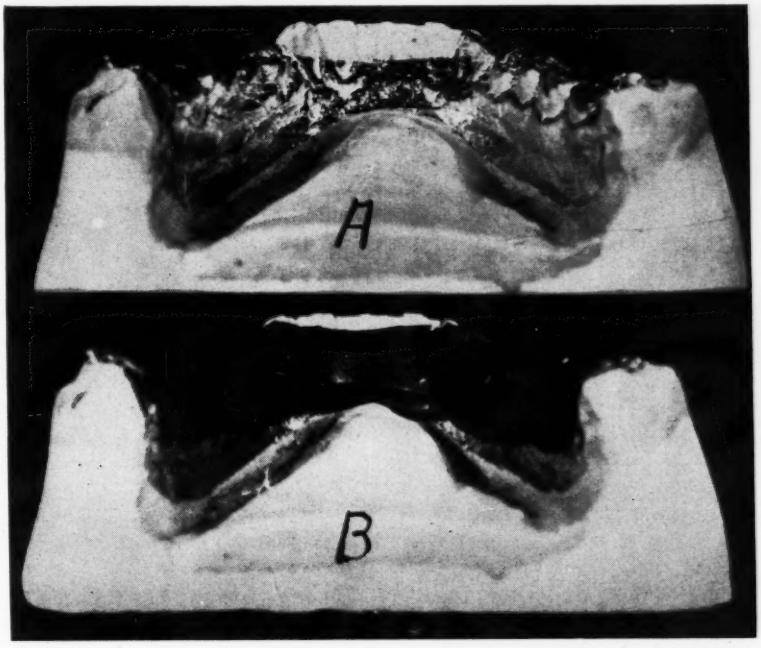



*Fig. 1—Construction of the baseplate: (A) Tin foil adapted to the lower cast following the design for any baseplate, and over the lingual, occlusal, and buccal surfaces of the posterior teeth. (B) Modeling compound placed on the tin foil to make the occlusal rim. (The photography was done by Doctor Guillermo Sammartino.)*

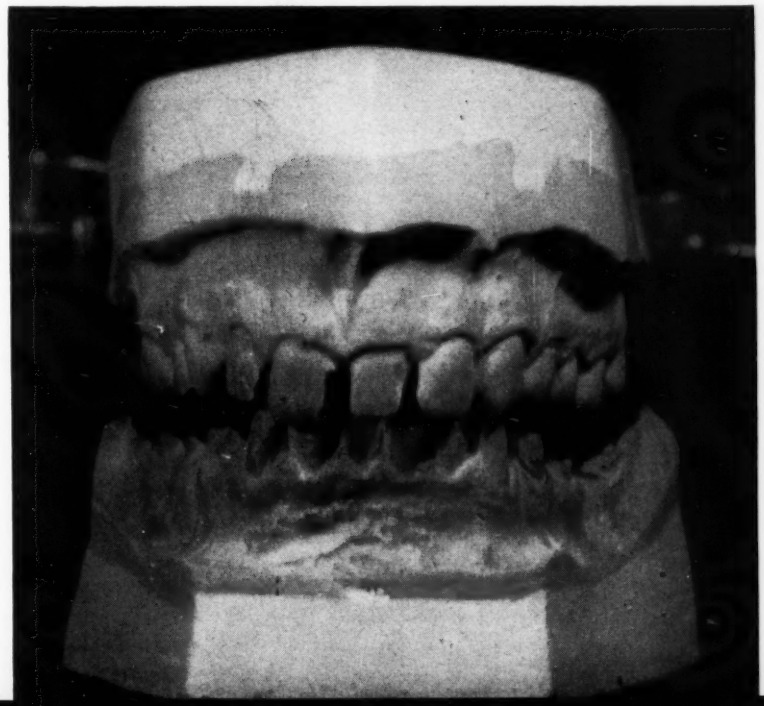
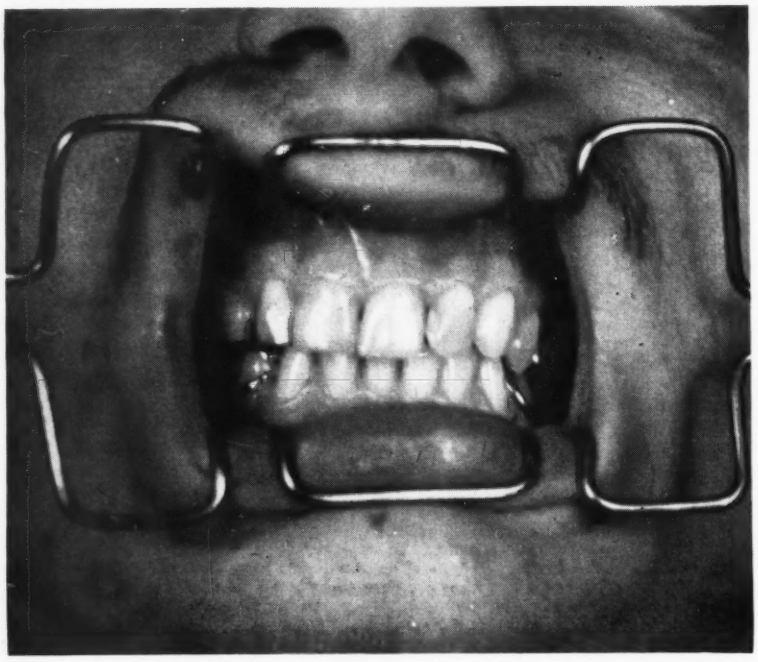


*Fig. 2—Articulator with models showing the vertical dimension recorded in the patient's mouth.*

## Ear and Sinus Symptoms

James B. Costen,[1] North American



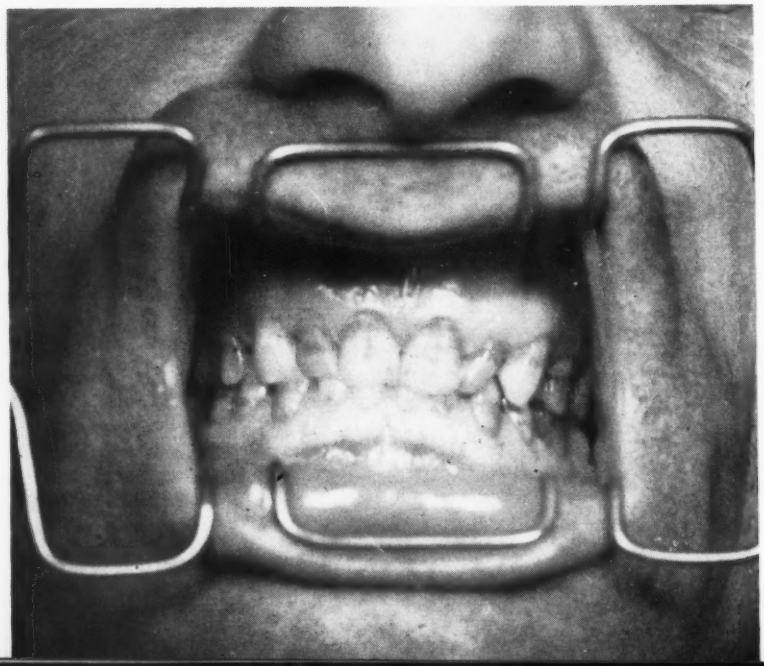


*Fig. 3 (top)—Removable metal appliance for the case shown in Figure 2.*

*Fig. 4 (center)—The appliance in place in the mouth. The incisors were restored with acrylic jacket crowns. Compare with Figure 2.*

*Fig. 5 (bottom)—Extreme overbite which caused abrasion of the labial surface of the lower incisors and cuspids and the lingual of the uppers.*

otorhinolaryngologist, presents some of the ear and sinus symptoms observed in eleven cases in which disturbance of mandibular joint function was the chief etiologic factor of abnormal ear and head conditions:

*Ear Symptoms*—1. Impaired hearing, continuously or with intervals of improvement.

2. Stopping, or "stuffy" sensation, in the ears, more marked about mealtime.

3. Tinnitus, usually "low buzz" in type; less often, a snapping noise while chewing.

4. Pain of a dull type within and about the ears.

5. Dizziness, mild; occasionally attacks of prostrating severity, definitely relieved by inflation of the eustachian tubes.

*Sinus Symptoms*—1. Headache, severe and constant, localized to the vertex and occiput, and behind the ears. (Typical site of posterior sinus pain; typical sinus history, and suggestive of an eye headache.)

2. Burning sensation in throat, tongue, and side of nose.

*Diagnosis*—The diagnosis of this condition was established by:

1. The lack of molar teeth, or badly fitting dentures permitting extreme overbite.

2. Mild catarrhal deafness, improved at once by inflation of the eustachian tubes.

3. Dizzy spells, relieved by inflation of the tubes.

4. Tenderness to palpation of the mandibular joints.

5. Marked comfort experienced by the patient on interposing a flat object between the jaws.

6. Presence of the typical headache

[1]Costen, J. B.: A Syndrome of Ear and Sinus Symptoms Dependent Upon Disturbed Function of the Temporomandibular Joint, Ann. Otol., Rhin. & Laryng. 43:1-15 (March) 1934.

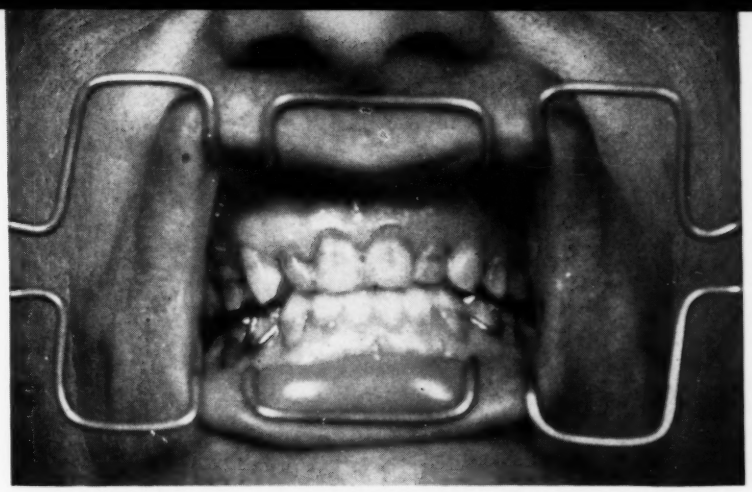


*Fig. 6 (top)—The case corrected with an appliance similar to that in Figure 3. Note the severe abrasion of the lower anterior teeth.*

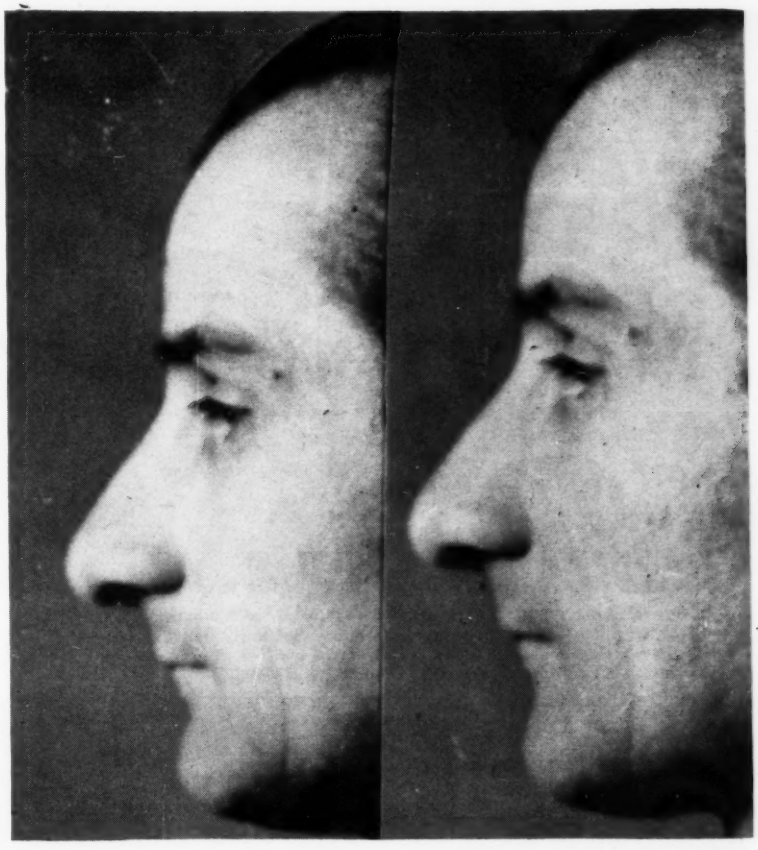


*Fig. 7 (center)—Profile views of the patient in Figures 5 and 6: (left) without the appliance; (right) with the appliance in place.*

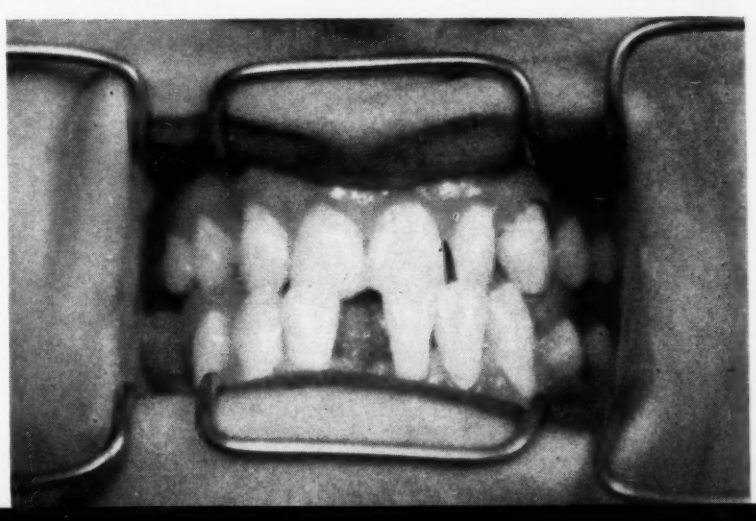


*Fig. 8 (bottom)—Medium open bite: The patient lost the lower right central incisor and complained of a tingling sensation in the gingivae.*

after sinus or eye involvement has been corrected; presence of the typical headache when the sinuses or eyes are found to be normal.

## Importance of Correct Vertical Dimension

It is easy to understand that organs such as the ear with the sense of hearing and equilibrium, the auriculotemporal nerve, the facial nerve, the tympanichord—all so close to the temporomandibular region—are affected by structural changes that take place in the latter. These changes appear when the plane of occlusion fails to keep the head of the condyle in its correct relation with the glenoid fossa.

It is important to remember the anatomic and physiologic relationships between the teeth, the temporomandibular articulation, the levator and depressor muscles and ligaments of the mandible, and the articular capsule and the articular disc which form the system of union of the mandible with the skull. If any one component of this system fails—frequently the teeth—the synchronism of function is interrupted and the relationship with the adjoining elements is altered. Thus, the so-called "vertical dimension" is a result of the functioning of the entire system. There is one, and only one, proper vertical dimension in each dentulous or edentulous patient. The accepted definition for the term is the resting position of the mandible in which the distance from the chin to the base of the nose normally is equivalent to the distance from the pupil line to the free margin of the upper lip. The "resting bite," or physiologic rest position, de-

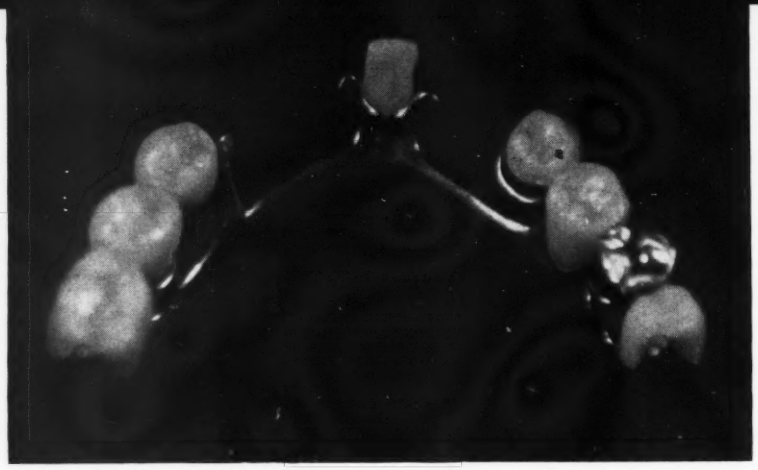


*Fig. 9—Appliance of metal and acrylic to correct the case shown in Figure 8.*

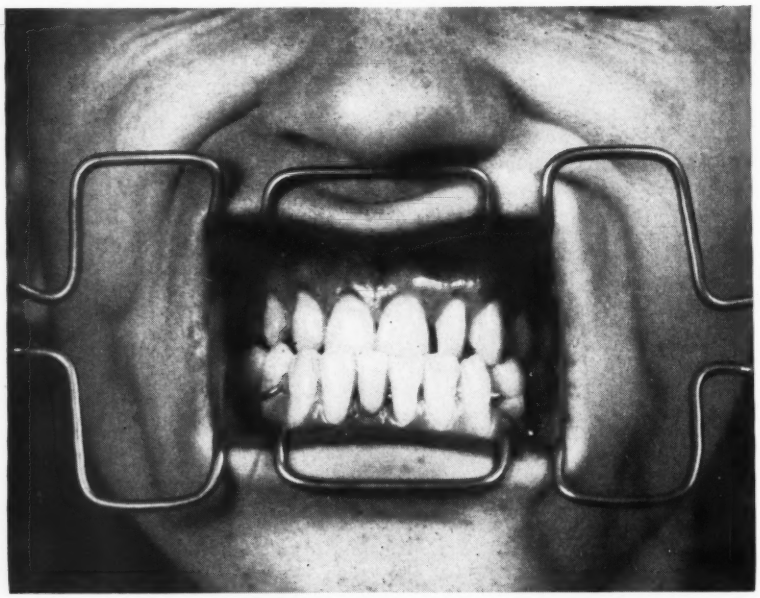
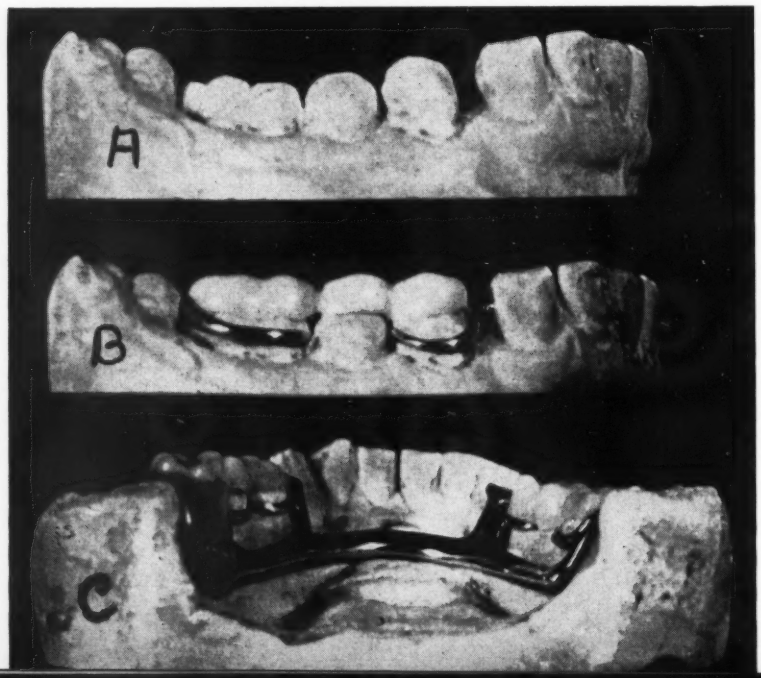


*Fig. 10—The appliance (Fig. 9) in the mouth.*

*Fig. 11—Correction of the plane of occlusion: (A) Right view of the cast. (B) The cast with the appliance constructed. (C) Lingual view of the cast with the appliance in position. Note the metallic-acrylic combination.*




scribed by Camani Altube[2] is one in which the mandible seems to be hanging and the levators exhibit only ordinary tone. The teeth do not fit tightly together; they are separated an average of 3 millimeters.

To produce occlusal contact, the mandible must be elevated 3 millimeters by means of muscular action. The teeth stop the movement when their occlusal surfaces are in contact, thus preventing the head of the condyle from moving from its resting position in the glenoid fossa. This is the state of "physiologic working position,"[3] the height of the bite. When this normal vertical dimension is decreased for some reason, the mandible is compelled to move a greater distance; therefore, the muscles need a greater degree of nervous stimulus. There is more constriction in the articulation which reaches the pathologic stage when the coordinated system is broken. To correct this condition, the vertical dimension must be increased.

In the excess of overbite, the anterior teeth, upper and lower, are in an abnormal position; that is, in cases of medium open bite the height of the bite is kept in correct physical occlusion. Some of the teeth which support the masticatory stresses will show the consequences sooner or later.

## Correction of Malocclusion and Vertical Dimension

The problem of malocclusion must be faced as a prophylactic or curative measure. Occlusal defects or de-

[2]Camani Altube, L. A.: Notes from his lectures, Rosario, Argentina, 1942.

[3]Maves, T. W.: Radiology of the Temporomandibular Articulation with Correct Registration of Vertical Dimension for Reconstruction, J.A.D.A. **25**:585-594, 1938.

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Willhelmy, G. E.: Relationship of Overclosure of the Mandible to Ear Pains While Flying, THE DENTAL DIGEST **47**:544-545 (December) 1941.

creased vertical dimension from any cause can be corrected physiologically and esthetically by the prosthodontist. Inlays or removable appliances are used. Use of the latter is advised to avoid the cutting of sound teeth.

The illustrations show some cases treated with removable appliances made of vitallium, using onlays on the posterior teeth. Some appliances were made in combination with acrylic for esthetics. It is necessary to obtain exact casts by taking the bite in the patient's mouth. Accurate casts are required to pre-establish the amount of space necessary for opening the bite and also to correct the protrusive movement. If the correction is attempted in the articulator, it will be a failure, because the articulator opens and closes at a fixed angle which is not the same in the mouth. Moreover, the articulator does not have the control of the vertical dimension that is present in the mouth.

To make the baseplates (A in Fig. 1), thick tin foil is adapted on the cast over the lingual, occlusal, and buccal surfaces of the posterior teeth. An occlusal rim of modeling compound is made on the tin foil (B in Fig. 1). This is carried to the mouth and the vertical dimension is determined (Fig. 2). Having recorded this stage of the "resting bite," the occlusal rim is trimmed down 3 millimeters and a film of pink wax is added. This is then carried into the mouth, and the patient is instructed to bite in centric until he finds the hard, compound underneath. The amount of 3 millimeters is the average differential between the physiologic rest position and the working bite. This determination is recorded with the lips opened slightly. From this established relationship a suitable splint is constructed.

*Chile* 1345.

# *Factors in Recurrent Gingivitis*

**K. McALLISTER, L.D.S., Liverpool**

PRACTICALLY, there are two main types of recurrent gingivitis: the indolent or chronic, and the active or pre-ulcerous. The former is of slower onset, and is due to local unclean conditions. The latter is often associated with upper respiratory infection, which in turn has a frequent association with mouth breathing and heavy cigaret smoking.

Colyer has stated that mouth breathing makes for a poor prognosis in any form of periodontal disease; the drying effect, especially if the upper lip is short, predisposing to anterior gingivitis. A more inaccessible source of infection of the gingival margin, however, is the chronically inflamed postnasal area, a large and favorable breeding ground for Vincent's organisms.

## Mouth Breathing

Mouth breathing often can be corrected, particularly in the young, by certain daytime exercises and a simple oral shield worn at night. The latter may be made of soft rubber, metal, or can be the frame type of Warwick James. In this way an important predisposing cause of the more intractable form of gingivitis can be prevented.

## Nutrition

Gingival tissues are subject to the same nutritional laws as other tissues; and although the many agencies which can affect nutrition make this the most speculative side of treatment, the value of a whole and sufficient diet in this respect cannot be overemphasized. McCarrison's theory that properly constituted food is the most important single factor in the prevention of disease has long been accepted. For instance, a prolonged deficiency diet may well be the cause of an indolent gingivitis being transformed into a rapidly destructive one. Clinically, however, it is found in the great majority of cases that the periodic or partial deficiencies encountered are not so severe that gingivitis cannot be prevented by efficient oral hygiene alone.

Unfortunately, the number of people who are able to do their part properly and persistently is not large. Where they can, and do, the most satisfactory results are observed year after year, even in the presence of adverse systemic states, local irregularities, or mouth breathing; though in the last-mentioned any relaxation of strict oral hygiene is likely to be followed quickly by recurrence. A large group includes those who are willing enough to undergo treatment in the first place and cooperate; they will usually return at intervals for inspection. Minor treatment at these times together with a checking of home methods results in a few days in a healthy gingival margin. In this way the general standard of oral hygiene, although not perfect, is greatly improved, with a resultant increase in the life span of the natural dentition, and an enormous reduction in the absorption of toxic matter from the gingival margins.

—From *The Dental Magazine and Oral Topics* 62:92-93 (July) 1945.

# *Partial Denture Prosthesis (Resiliency In Articulation)*

**ROBERTO HARGUINDEGUY, D.D.S., Buenos Aires, Argentina**

***The difficulties encountered in the construction of a partial denture are discussed, and the characteristics of both the articulated and elastic stressbreakers, which have been used to correct the difficulties, are listed.***

***Doctor Harguindeguy presents a simplified technique for the construction of the segmented appliance which gives resilience to the articulation of the partial denture.***

ANY PARTIAL denture prosthesis must not cause pathologic disturbances in the area to which it is applied. The remaining teeth and the alveolar ridge must be preserved in restoring the mutilated masticatory mechanism. When the dental arches are shortened because of missing posterior teeth, the prosthetic appliance must restore the triturating surfaces by means of an extension over that area.

## Difficulties in Construction

This restoration presents the greatest difficulty encountered in partial denture construction. First, the teeth remaining do not tolerate masticatory stresses, and, second, the mucosa under the same stresses, through the saddles, is deformed and compressed an average of 1.3 millimeters. This characteristic of the mucosa, the action of the tongue, lips, cheeks, and adhesive foods, and the pressure of the upper prosthesis, cause mobility of the saddles which, depending on the way they are anchored, might produce movement of the abutment teeth or lesions of the supporting tissues.

In attempting to avoid the leverage produced by the masticatory pressure, some prosthodontists have tried

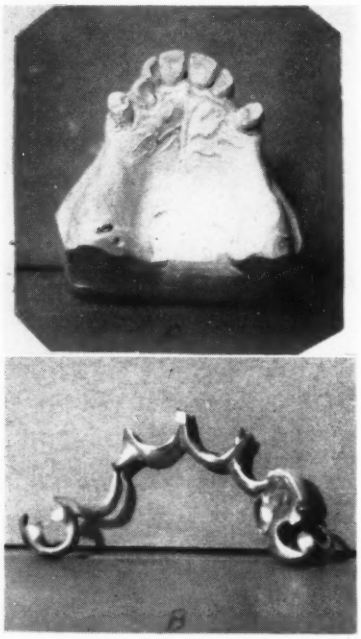

*Fig. 1—Above: Model showing a missing tooth within the dentulous area. Below: The tooth is replaced in a form to obtain proper function.*

to equalize the functional capacity of the restored arch by taking impressions with compression of the mucosa. Masticatory efficiency is obtained by this method, but the health of the mucosa and the alveolar ridges is endangered by the movements of the appliance in function. It is preferable to reduce the masticatory effect and to preserve the dental organs and alveolar ridges. The resorption of the latter can be stopped by:

1. Reducing to a fourth the stress sustained by the alveolar process through the mucosa.

2. Taking impressions which keep the mucosa in a "relieved" state (mucostatic).

3. Adapting the bone structure with a new orientation of its trabecula to its new function.

4. Preventing irritation of the mucosa, especially of the buccal vestibule and the zones close to the necks of the remaining teeth.

5. Polishing the surface of the saddle that fits over the mucosa.

6. Making long saddles to distribute the masticatory pressures over a greater surface.

To retain the remaining teeth, which should not be in contact with the saddles, constitutes a mechanicostatic problem. If the saddles cover only small surfaces, they cannot be retained because of the extrusive forces, the same physical principle which governs the retention of full dentures. To oppose those forces, the saddles, now a "biostatic problem," must be anchored in some way to retain the appliance against the extrusive forces and to prevent irritation of the remaining teeth by the movement of the saddles under the masticatory stress. Moreover, the alveolar process will receive the masticatory impacts, on the remaining teeth in a "dental" form and on the appliance through the saddles in a "gingival" form.

## Articulated and Elastic Stressbreakers

The characteristics of both articulated and elastic stressbreakers, which have been used to correct this condition, are as follows:

*Articulated Stressbreaker*—1. The parts are constructed for a function which they do not perform.

2. The appliance is complicated and is difficult to wear.

3. Depending on the type of articulation used, certain unnecessary movements are permitted.

4. When used in pairs, the movements are prevented or diminished.

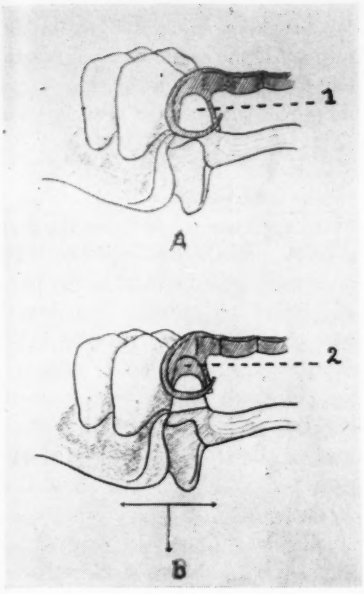


*Fig. 2—Resiliency in articulation: (1) Extension attached to the saddle. (2) Preparation made in body of clasp for reception of extension. (A) Separable articulation in which parts are attached. Movement is prevented by the intrusion of the saddles in the mucosa, and the appliance is anchored firmly to the abutment teeth. (B) When in function, the segments separate and the saddles move without affecting the abutment teeth.*

5. The presence of a palatal or lingual bar between the saddles prevents the oscillating movement around the sagittal axis.

6. When only one articulated stressbreaker and a rigidly anchored connecting bar are used, it is impossible to obtain the desired result.

*Elastic Stressbreaker*—1. The essential movements are permitted.

2. The appliance is unstable in the mouth.

3. If the appliance is short, it must be thin, and consequently will bend easily.

4. A long appliance is preferred.

5. If removed from the mouth, it can be bent easily. This makes impossible its restoration to the original position in the mouth.

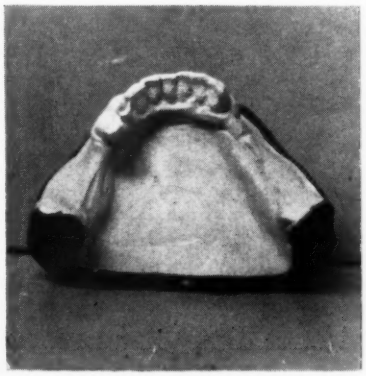

*Fig. 3—Model obtained from a perfect impression.*

## Segmented Appliances

We conclude from these facts that neither of the stressbreakers, the articulated nor the elastic, gives satisfactory results. Other prosthodontists, George Stein in Austria and Beat Muller in Switzerland, sought to solve the problem by making the appliance in two parts, or segments, one corresponding to the dentulous zone and the other to the denture-bearing area. Beat Muller[1] concludes that in a resting position the appliance should be anchored firmly on the abutment teeth, and that under the masticatory stress the saddles should move because of tissue resilience, losing their contact with the abutment teeth. If a tooth is missing within the dentulous zone, it should be restored in a form to obtain proper functional capacity (Fig. 1).

*Resiliency in Articulation*—To attach the two parts of the appliance, Beat Muller makes a separable articulation (Fig. 2). Inasmuch as the segments are attached, no movement is permitted but that produced by mastication. In this way the appliance is anchored firmly to the abutment teeth, thus withstanding the extrusive forces. When functional pressure is exercised, the segments of the articulation are separated, leaving the saddles free for any movement, depending on the resilience of the mucosa (B in Fig. 2) without affecting the abutment teeth. Beat Muller's technique for constructing the articulation, which I call "resilient," is difficult. I have tried to simplify the technique to make it more practicable.

## Simplified Technique

1. Make a model (Fig. 3).

2. Adapt a double thickness of tin foil, 0.2 millimeters thick, to the model (Fig. 4).

3. Take an impression from the

[1]Muller, Beat: Abnehmbare partielle Zahnprothesen, Berlin and Vienna, Urban and Schwarzenberg, 1936.

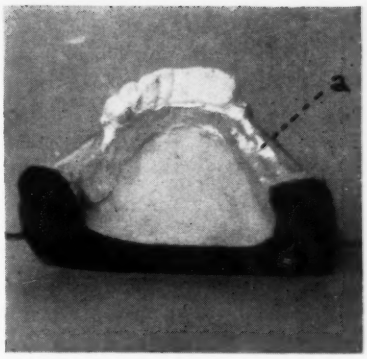


*Fig. 4—Tin foil (a), 0.2 millimeters thick, is adapted to the model in double thickness.*

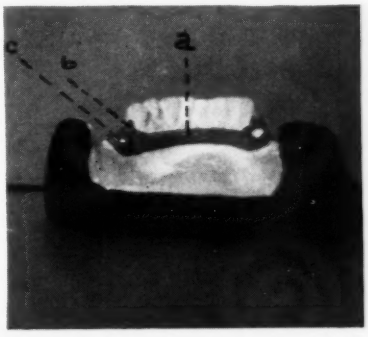


*Fig. 5—Investment model reproduced from that in Figure 4. Carving in wax: (a) lingual bar; (b) extension of resilient articulation; (c) retention for base material.*

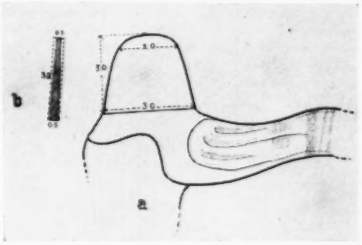


*Fig. 6—Form and size of extensions: (a) anterior view; (b) sectional view.*

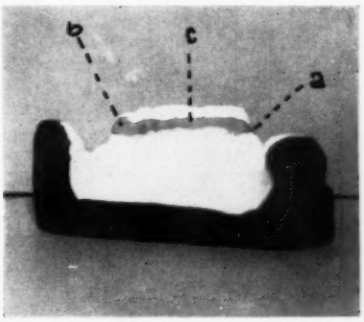


*Fig. 7—Investment model reproducing tin foil, lingual bar, and extensions. The clasps (a), preparation for body of clasp (b), and continuous clasp (c) are shown carved in wax.*

model, and pour it in investment.

4. Carve on the investment model (in a lower case) a lingual bar of casting wax (A in Fig. 5) and the extensions (part of the resilient articulation attached to the saddles) (B and C in Fig. 5).

5. Cast it, and using stones and discs, finish the "extensions" to the size and shape required (Fig. 6).

6. Place the appliance in position on the model as is shown in Figure 2.

7. Take an impression, pour it in investment, and obtain a model on which are reproduced the tin foil, the lingual bar, and the "extensions" for resilient articulation (Fig. 7).

8. Carve in casting wax the clasps for the preparations that are to correspond to the extensions and eventually the continuous clasp (Fig. 7), or the replacement of the missing tooth (Fig. 1).

9. Cast.

If it is necessary to join both parts of the appliance, or to divide the masticatory pressure between the abutment teeth and the saddles, the parts are joined by means of an elastic wire (Fig. 8), the thickness of which depends upon the amount of movement desired. The resilient articulation thus will act as a frame preventing the deformation of the elastic wire.

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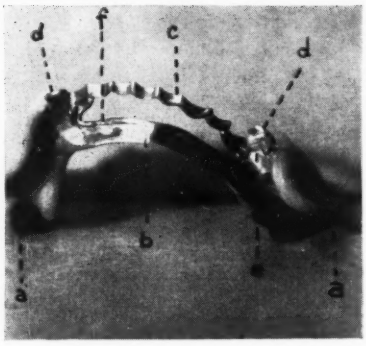


*Fig. 8—Finished appliance: (a) saddles; (b) lingual bar; (c) continuous clasp; (d) clasps; (e) resilient articulation; (f) elastic wires to join both segments of the appliance.*

## *Sharpening of Excavators and Chisels*

(*Continued from page* 619)

has become a surface which reflects light (Fig. 2).

3. The surfaces of a straight edge are at a 45-degree angle (Fig. 3).

4. If the angle is more acute, the instrument becomes fragile and dangerous for the tissues (Fig. 4).

5. If the angle is more open, the instrument is inefficient (Fig. 5).

*Inconvenience of Sharpening with Arkansas Stones*—1. Impossible to maintain exact and continuous position (Fig. 6).

2. Instrument may turn on its longitudinal axis and consequently not lie flat (Fig. 7).

3. For excavators one must combine a rotating and a rubbing movement which is almost impossible.

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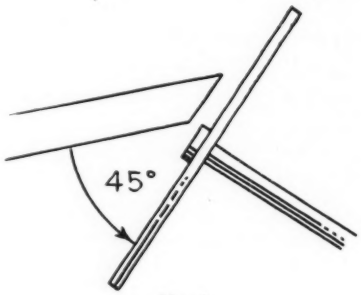



*Fig. 8*

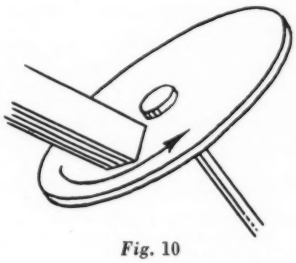


*Fig. 10*

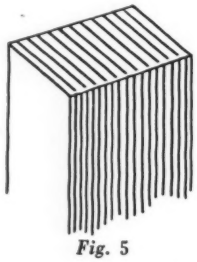


*Fig. 5*

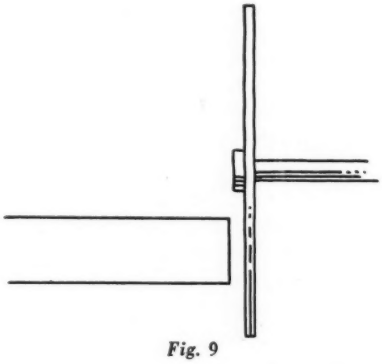


*Fig. 9*

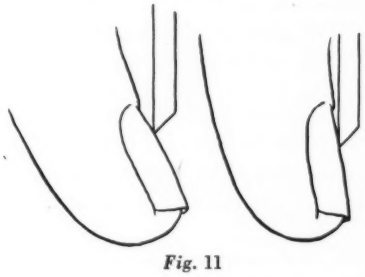


*Fig. 11*

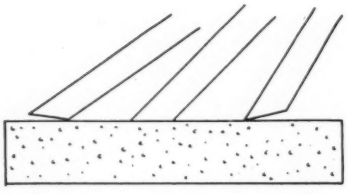


*Fig. 6*

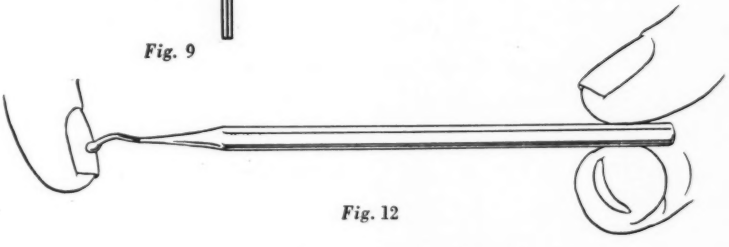


*Fig. 12*

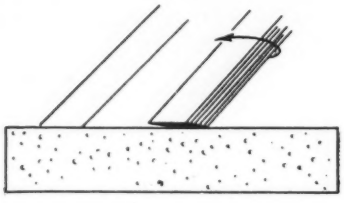


*Fig. 7*

# *Extra-Oral Retention Splints*

**LEOPOLDO PANATT W., D.D.S., Santiago, Chile**

***The use of specially designed, modified external fixation appliances is demonstrated in the reduction of mandibular fractures, the postoperative treatment of ankylosis of the temporomandibular joint (including case report), and in the fixation of the fragments following bone graft in the mandible.***

FOR MANY YEARS methods or procedures have been sought which would permit us to make use of all the necessary points of attachment for fixation appliances in the treatment of severe traumatisms of the maxilla and mandible. The teeth are without any doubt the ideal points of attachment for fixation appliances, but they cannot always be used, as when teeth are missing, or if they are fractured, dislocated, or infected.

In 1934 Bercher and Ginestet of Paris described an ingenious external fixation appliance for the treatment of fractures of the mandible in edentulous patients. It is being used again, after a long period of non-use, now that it has been popularized by Roger Anderson and other investigators. We have used the extra-oral splint here in the treatment of fractures of the mandible, in the postoperative treatment of ankylosis of the temporomandibular joint, and in the fixation of the fragments following bone grafts for the restoration of substance lost in the resection of the mandible.

## Mandibular Fractures

The simple system of stainless steel wire pins, clamps, and a rigid external connecting bar (Fig. 1) has been used successfully in the treatment of simple fractures of the mandible without inflammatory complications and which could be reduced manually. Inasmuch as the use of this appliance is limited exclusively to recent fractures that are easy to reduce, we have modified it by using a movable connecting bar instead of the rigid bar (Figs. 2 and 5).[1] The appliance was designed and made by the engineer, Federico Panzer. It has proved successful and we feel that it has solved the difficulties which have been encountered in the reduction of the

*Fig. 1—The extra-oral fixation appliance with a rigid connecting bar for simple fractures.*

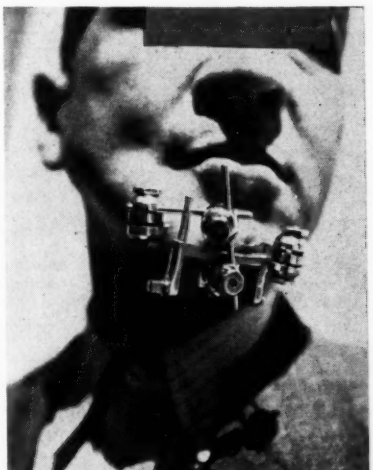


*Fig. 2—A modified extra-oral fixation appliance with a movable connecting bar instead of a rigid bar.*

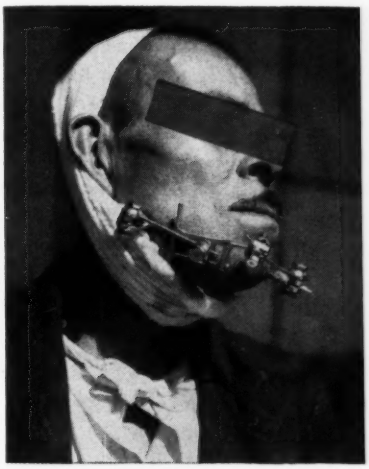


*Fig. 3—One lateral extension of the appliance attached to the clamp placed in one of the fragments, and a rigid bar from the clamp in the angle of the mandible extending to the movable mechanism.*

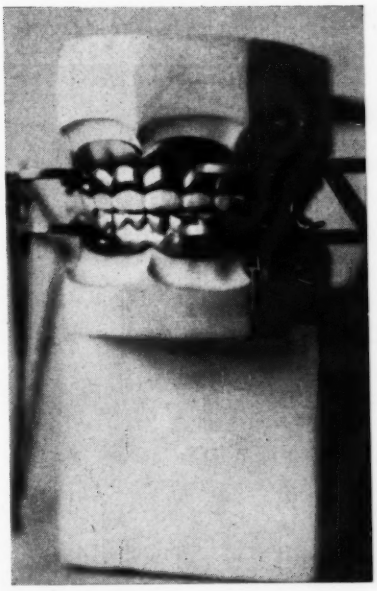


*Fig. 4—The Darcissac physiologic mobilizer.*

[1]Panatt W., Leopoldo: Extra-Oral Treatment of Mandibular Fractures, Revista Dental de Chile **36**:163-180 (April) 1943.

fragments by other methods.

The appliance is rectangular in shape and has a screw on one side to mobilize a mechanism which carries a clamp. A lateral extension from this clamp is attached to another clamp which has an extension into one of the fragments. From the clamp of the other fragment, a rigid connecting bar, or another similar appliance, is connected to the movable mechanism (Fig. 3). When the mechanism, the runway of which measures 35 millimeters, is moved, the bony fragments are displaced in different planes. These displacements can be made at will according to the direction, position, and number of appliances used (Fig. 3).

The stainless steel pins are implanted directly in the bone through the skin by means of an electric drill. For stability, the pins should be placed in diverging positions and as near to the lower border of the mandible as possible, inserting them as deep as necessary.

### Ankylosis of the Temporomandibular Joint

The postoperative treatment of ankylosis of the temporomandibular joint is essentially mechanicotherapeutic. The surgeon resects a sufficient amount of bone from the joint to allow the patient to make the movements of the mandible freely. A few days after the operation the buccal opening is used to attach a special appliance which compels the patient to execute all kinds of mandibular movements. The purpose of these continuous movements is to facilitate the formation, in the operated joint, of a pseudo-arthrosis, and to prevent the formation of an osseous callus which would cause a recurrence of the ankylosis. The mandibular movements must be strictly regulated by the operator if the greatest therapeutic value is to be obtained from them.

We have found that the ideal apparatus for this treatment is Darcissac's physiologic mobilizer (Fig. 4). This is formed of two splints for the upper and lower dental arches, to which two extra-oral bars, upon which the elastic force of the rubber bands will act, are attached. By changing the direction of the elastic forces on the extra-oral bars, mandibular movements of opening and closing, lateral movements, and a combination of all mandibular movements, are produced. The pressure exerted upon the bars by the elastic force will compel the patient to open his mouth. Muscular fatigue, dryness of the mucosa, and the flow of saliva,

*Fig. 6—Patient with ankylosis using a clothespin as an aid in opening the mouth.*

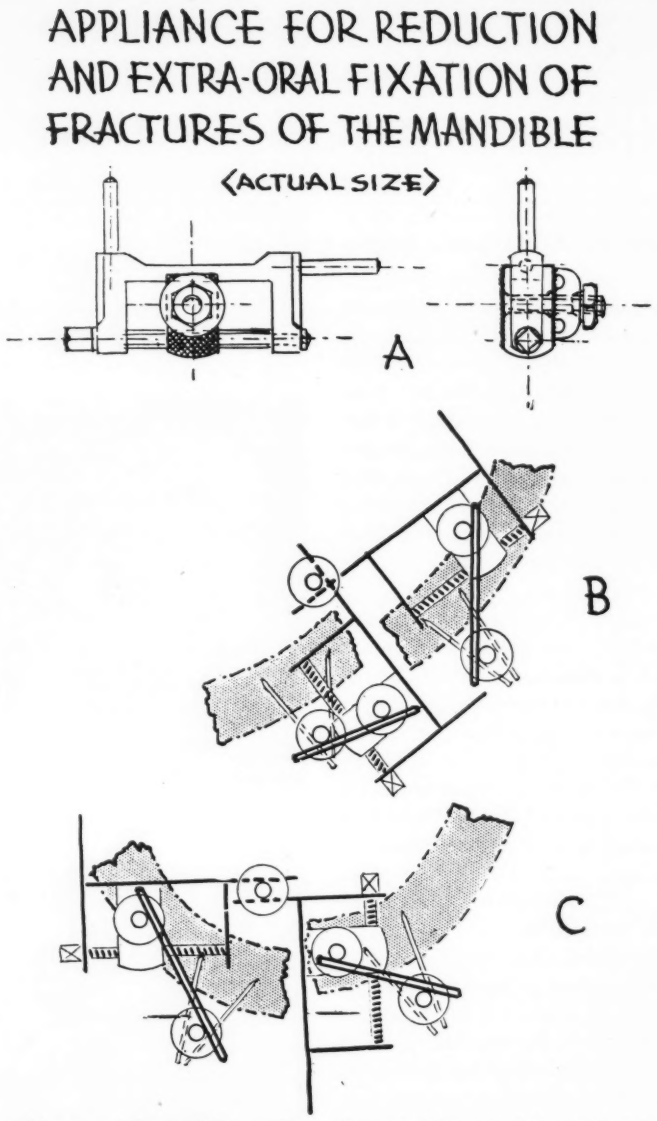



*Fig. 5—Diagram of the modified appliance shown in Figure 2: (A) actual size of the movable mechanism; (B and C) movements of fragments possible by means of appliance.*

*Fig. 7—Anterior view of patient with appliance in position, showing the rubber bands in function.*

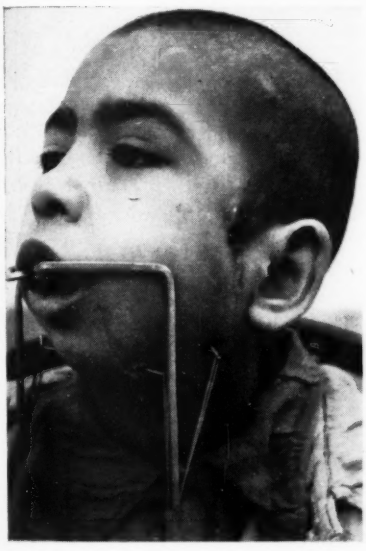


*Fig. 8—Profile view of patient and appliance shown in Figure 7.*

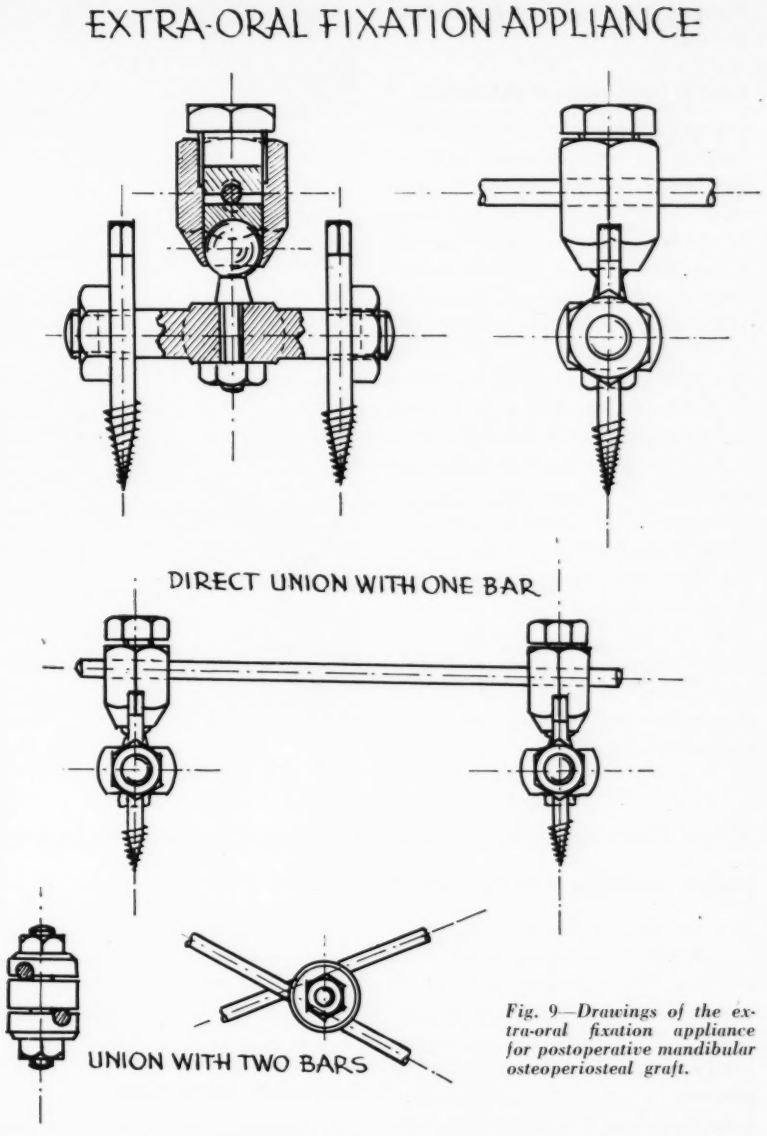



*Fig. 9—Drawings of the extra-oral fixation appliance for postoperative mandibular osteoperiosteal graft.*

will induce him to close his mouth. This continual opening and closing of the mouth is the therapeusis. To obtain this action, the appliances must be solid, well attached, continually mobile, and well tolerated by the patient. Their construction is not simple, and perfect impressions of both arches, the lower being the more difficult, are necessary.

*Case History*—L. D. M., nine years old, underwent an operation for bilateral ankylosis of the temporomandibular joint in 1937. In 1943 another operation on both joints was done by Doctor Alberto Rahausen, who obtained a 10-millimeter opening of the mouth, which was not great enough to permit the taking of good impressions. The continual chewing of gum and the use of a clothespin as a wedge did not help to increase the opening (Fig. 6).

Strong elastic forces were applied directly to the bone, into which, by means of the electric drill, a Kirschner wire was passed through the mental region at the level of the cuspids and close to the lower border of the mandible to avoid injuring the dental follicles. The free ends of the wire were bent in an L shape, and a stainless steel screw was placed in each angle of the mandible. An acrylic splint was made for the upper arch (Fig. 7). Two square bars (3 millimeters thick) were attached to the vestibular borders (bicuspid regions) of the splint and emerged from the mouth, then curving downward at a right angle (Figs. 7 and 8). Rubber bands were attached from the lower ends of these bars to the wires in the mental region and to the screws in the angles of the mandible. These elastic forces, which were left in place day and night for about fifteen days, made an opening of 15 millimeters which was large enough to permit taking good impressions

for making a special intra-oral appliance.

### Loss of Substance of Mandible

One of the chief requirements after making an osteoperiosteal graft in the case of partial loss of the substance of the mandible is the fixation of the fragments for a period of between forty and sixty days. If the patient is dentulous, any interdental splint which will hold the fragments in the right position can be used. If the patient is edentulous, the extra-oral method of fixation must be used. We have used the apparatus (Figs. 9 and 10) which was designed and made by Mr. Panzer. Two stainless steel screws are placed in each fragment. The second part of the apparatus, the saddle, contains lateral perforations through which pass the heads of the screws. The third part of the apparatus consists of the external bars which are connected easily to the heads of the saddles by means of a ball joint.

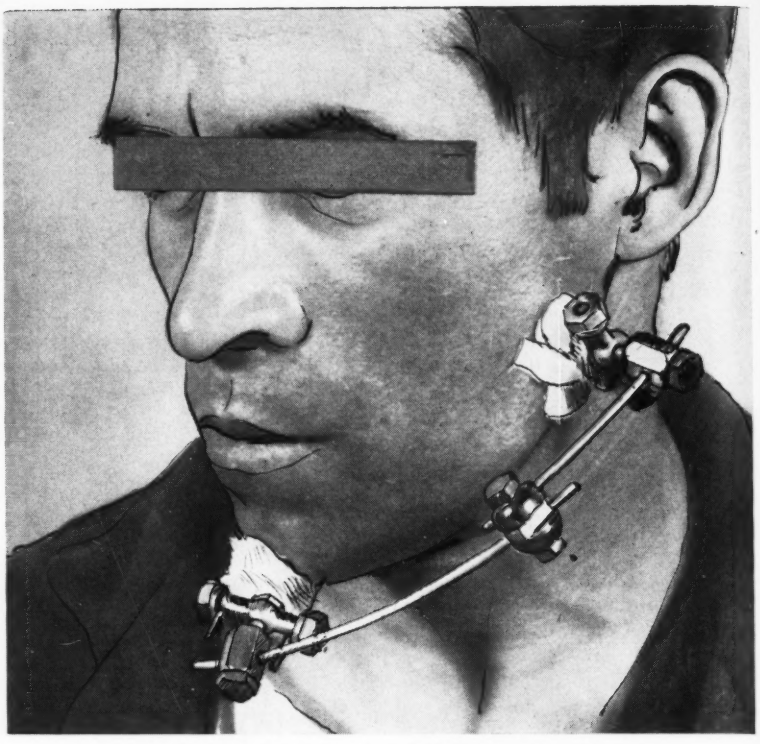


*Fig. 10—Patient with the extra-oral fixation appliance in place.*

# *The Prevention of Recurrent Vincent's Infection*

**Major RICHARD CHACE (DC) AUS**

THE HISTORY of patients with recurrent Vincent's infection usually follows one of two definite patterns. In the first, an acute attack is treated successfully and the patient is well until another attack occurs. In the other, most of the subjective symptoms disappear, but the gingivae remain inflamed and the typical picture of chronic Vincent's is present and periodically flares up and becomes acute. In old cases with several recurrences, the destruction of the investing tissue often is tremendous. Both of these recurrent types are the result of incomplete treatment by the dentist and cause the loss of a great number of man-hours, both by the dentist and the patient.

This paper concerns the follow-up treatment of acute Vincent's that is so important and generally neglected. If the procedures are followed carefully, recurrent Vincent's with its destruction of the investment tissues will be held to a minimum. Drugs are of minor importance in this follow-up treatment. The mouthwash used during the acute stage should be discontinued and no strong caustics should be used in office treatment.

### Treatment Procedures

1. As soon as the acute symptoms subside, all sources of irritation to the gingival tissues should be eliminated, overhanging restorations smoothed, and open or malposed contact points closed by properly contoured restorations. A careful prophylaxis should be given, making sure that all bits of subgingival calculus are removed.

2. The patient then should be taught a scientific technique of toothbrushing (Charter's, Stillman's, or rolling). If much interproximal tissue has been lost, the interdental stimulator is almost essential for proper massage of this area.

3. Food impactions caused by plunger cusps should have been eliminated during the treatment of the acute stage; but since traumatic occlusion is often a contributing factor in any periodontal disease, the occlusion should be examined carefully. Almost invariably some equilibration will be found necessary. The goal of occlusal equilibration is maximum occlusal contact with equitable distribution of the occlusal forces.

4. All periodontal pockets should receive prompt treatment. Most pockets can be eliminated by packing and curettage, although surgical procedures may be used in pockets measuring over 4 millimeters. Here again the importance of toothbrush stimulation must be stressed.

5. After the proper gingival tone has been obtained, attention should be directed to the primary incubation zones, where large numbers of Vincent's organisms are present even in an apparently health mouth. Autogenous infection occurs from these

(*Continued on page* 655)

# *Surgical Treatment of Oral Lesions Resulting from Prostheses*

**RICARDO C. GUARDO, D.D.S., Buenos Aires, Argentina**

***The various types of paraprosthetic lesions of the mouth, thus named because of their origin, are described; and the treatment procedures, including the stages of the surgical operation and the postoperative therapy, are presented.***

## Types of Lesions

If a prosthesis was not well adapted to the tissues at the time of its insertion, or has lost its adaptability, or if its occlusion has not been well balanced and it acts as a mechanical irritative factor breaking the biologic tissue equilibrium, a variety of lesions of the oral mucosa may result. These lesions are called "paraprosthetic" because of their relation to the prosthesis. They can be of the acute type, which heal as soon as the irritant is removed; or of the chronic type, hypertrophic or hyperplastic neoforms, the growth process of which can be stopped by eliminating the cause, but which necessitate excision before function can be restored.

Generally the soft tissue is more affected than is the hard tissue by the traumatic action of the prosthesis. Following the slow and progressive atrophy of the bone when the equilibrium is broken, the mucosa, instead of undergoing fibrous retraction, undergoes hypertrophy, to which is added an acceleration of the atrophy of the bone. It is common to observe a hypertrophy of the mucosa of the palate if an irritation was caused by a vacuum chamber between the denture and the palate, or if the firm soft tissue of the ridges has become flabby, as shown in Figure 1. These lesions are observed commonly in cases of full upper dentures in which the occlusion is not well balanced or if only the six lower anterior teeth remain in occlusion.

Sometimes the periphery of the denture acts as an irritant on the gingivolabial or buccal mucosa and produces a neoformation of the fibromatous type (Fig. 2). Generally the neoformation is benign, but if it finds a favorable field it may become malignant. These fibromatous neoformations may grow excessively, and sometimes resemble a second lip which covers the anterior part of the

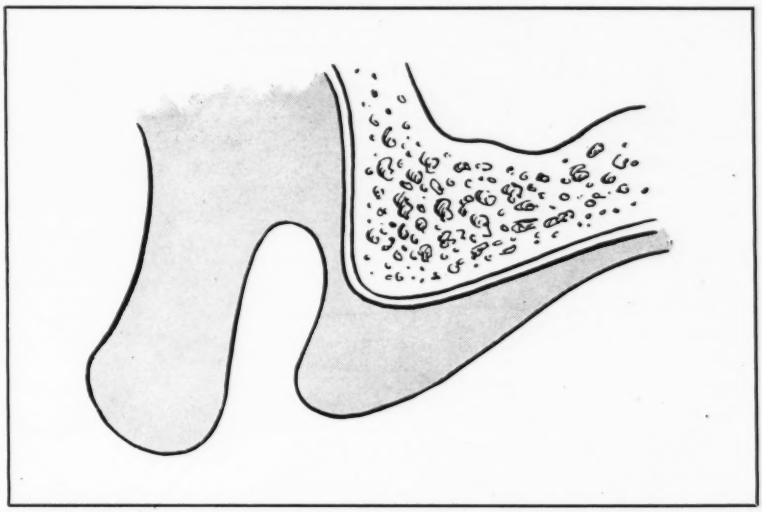


*Fig. 1—A sagittal section showing the relationship between the atrophied bone and the fibrous hyperplastic mucosa in the anterior segment of the ridge.*

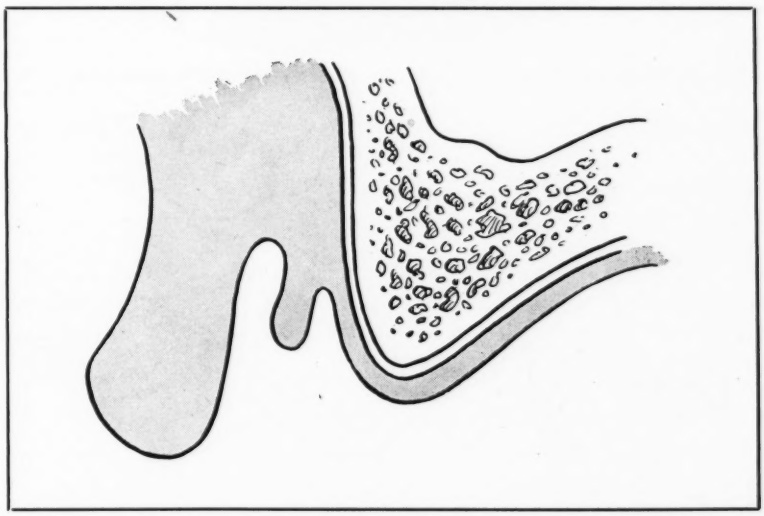


*Fig. 2—A sagittal section showing a neoformation in the anterior vestibulum. Otherwise the relationship between the mucosa and the bone is normal.*

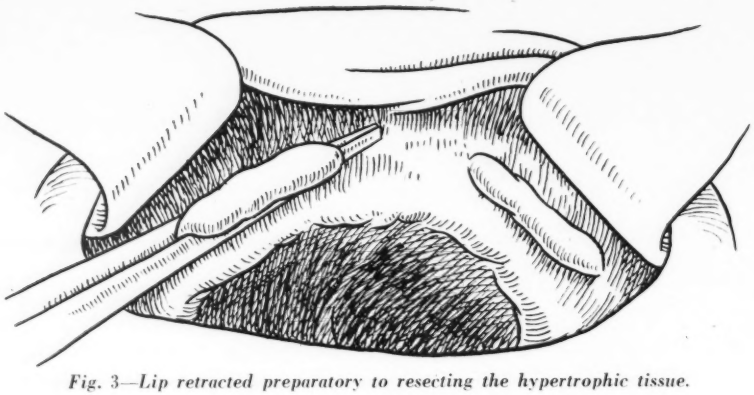


*Fig. 3—Lip retracted preparatory to resecting the hypertrophic tissue.*

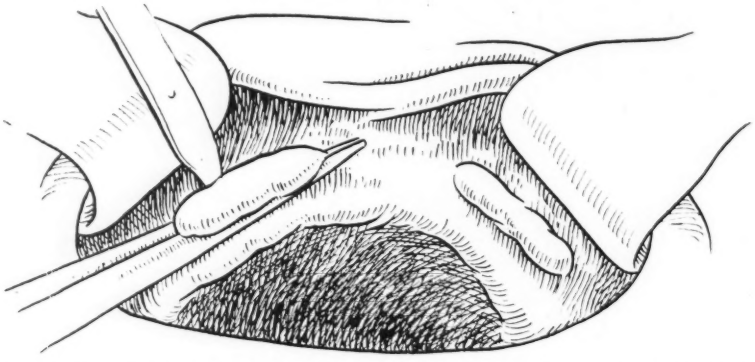


*Fig. 4—The neoformation in the right quadrant being freed from the basal tissue.*

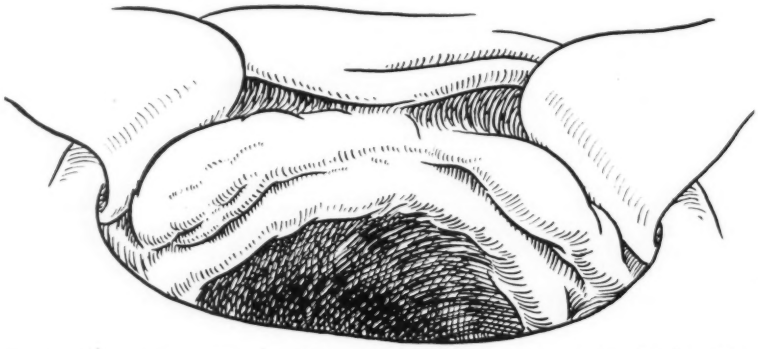


*Fig. 5—Neoformation almost covering the vestibular surface of the alveolar ridge.*

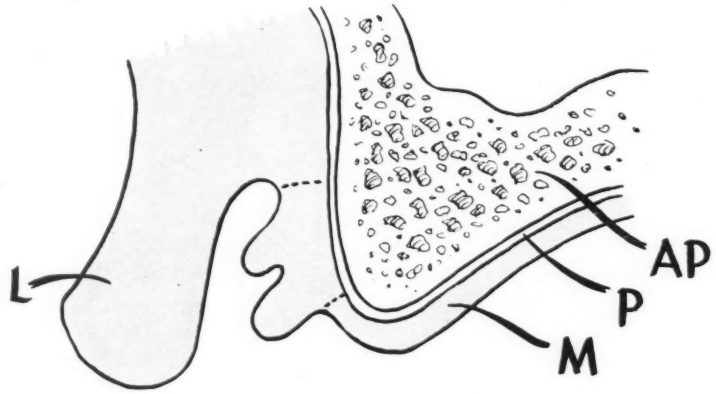



*Fig. 6—L, lip; M, mucosa; P, periosteum; AP, alveolar process. Dotted lines show extent of neoformation to be removed.*

denture. At other times the tumor is segmented on its long axis, the segments superposing on each other like the leaves of a book. The surgical removal of these fibromas will be discussed here.

## Treatment Procedure

If the fibroma is well pediculated and the surgeon is sure that after its removal there will be enough retention for the denture, the technique to follow is that sketched in Figures 3 and 4. The bistoury should pass behind the hemostat that holds the pediculum of the tumor and should be held against the anterior border of the hemostat when the excision is made, as is shown in the illustrations.

If the tumor covers almost the entire vestibular surface of the alveolar ridge (Figs. 5 and 6), and if, after its removal, it is necessary to restore the vestibulum to furnish good adaptation of the denture, the following technique is advised:

1. Take a good plaster impression, including the tumor and the entire vestibulum, and make a cast.

2. Excise the neoformations, giving good form to the vestibulum and deepening it (Figs. 7 and 8).

3. Vulcanize a baseplate on the cast. The baseplate (Fig. 9) will be used as a guide during the surgical operation, and, in the postoperative stage, will act as a matrix to aid the normal healing of the soft tissue. This baseplate, moreover, will act as a pattern for the new vestibulum, which thus will have a round and well polished periphery of adequate thickness.

## The Surgical Operation

*First Stage*—Infiltration anesthesia is used over the vestibulum.

*Second Stage*—The upper or lower lip should be retracted well to obtain the best exposure of the field. The incision is made on the upper part of the ridge immediately above the fibrous neoformations, and follows a parallel line to the alveolar ridge. The incision should extend through the soft tissues until the periosteum is reached.

*Third Stage*—The gingival of the incision should be retracted with two

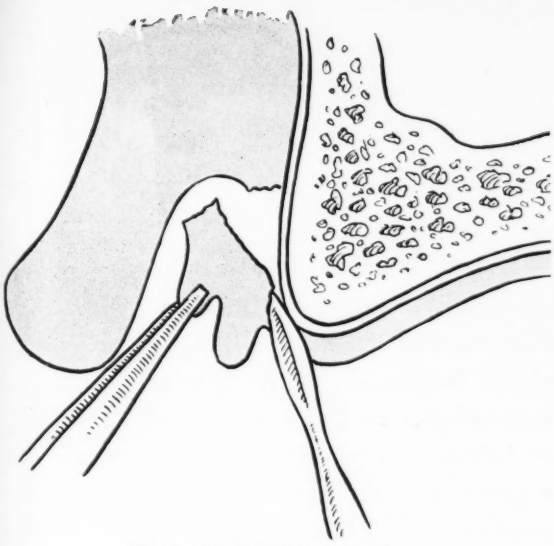


*Fig. 7—Neoformation excised.*

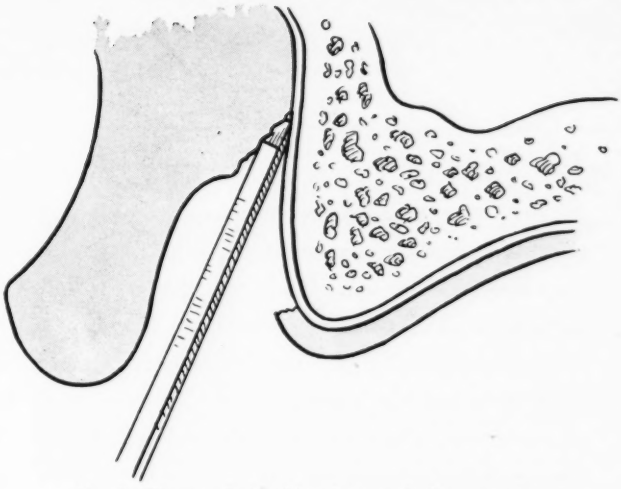


*Fig. 8—Tissue relationship after surgical treatment.*

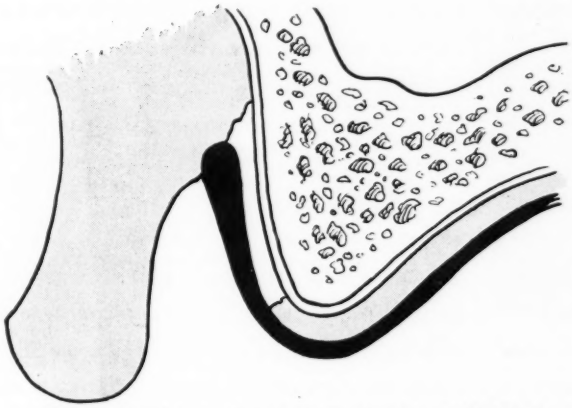


*Fig. 9—Baseplate in place after the operation is finished.*

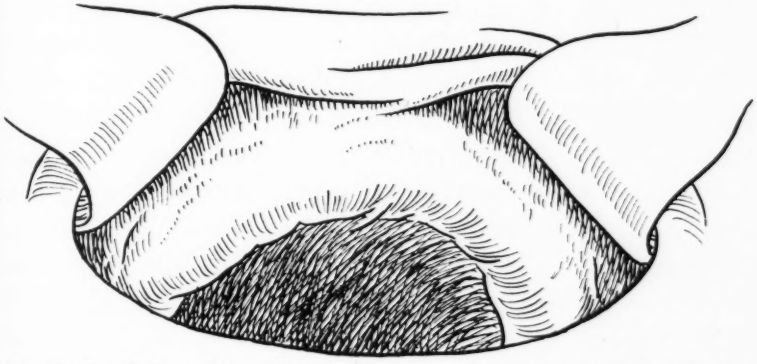


*Fig. 10—Vestibular surface of the alveolar ridge after surgical removal of the neoformation.*

forceps and the gingival flap dissected, care being taken not to incise the periosteum, until the sound fibromucosa which is firmly attached to the ridge is reached. All this mucosa and fibrous tissue is then resected with the scissors or bistoury, leaving the alveolar periosteum uncovered.

*Fourth Stage*—Using a periosteotome, loosen the mucosa from the periosteum on its highest part the full extent of the incision. Wash the wound, and place the baseplate with denture powder to keep it in position.

## Postoperative Treatment

The patient is given the following advice after the operation:

1. Do not remove the baseplate.
2. Apply ice or rinse the mouth with a mild antiseptic every two hours.
3. Eat light meals, and avoid solid food.
4. A sedative may be taken if there is pain.

The baseplate is removed and cleaned after forty-eight hours. Wash the wound with a mild antiseptic, and replace the baseplate. This must be done for ten to twelve days, which is time enough to permit epithelization of the wound.

# The Editor's Page

SCIENCE IS a paradox. Scientific methods are applied to advance human comfort and to relieve human distress. The same kind of methods are used to produce the destructive tools of war. The beneficent results are spread unselfishly among mankind; the scientific secrets of destruction are guarded carefully. There are no international secrets among the biologic scientists nor among the dentists and physicians of the world. Discoveries that are made to relieve human suffering are announced gladly among friends and foe.

The true internationalism of science is symbolized in this particular issue of this magazine. The contributors to this issue are our colleagues from South America, who are making available their dental knowledge to the dentists of North America and the remainder of the world. This issue, is, likewise, the fiftieth anniversary volume of THE DENTAL DIGEST, a professional journal that has carried the writings of scientific men from many countries for half a century.

This year is also the fiftieth anniversary of the great discovery by the German physicist, Wilhelm Konrad von Roentgen. In the fifty years since Roentgen gave us the x-ray, we have been at war twice with German imperialism and autocracy. We have crushed Prussianism and Nazism, but the substantial scientific works of Ehrlich, Wassermann, Roentgen—Germans all—will live long after the ignoble figures of Nazism. Regardless of the political and economic systems under which they operate, the men of science project their thinking and their aspirations beyond national boundaries. Political unrest is a transitory thing; scientific achievements are eternal.

A dentist somewhere in the United States makes an observation or discovery that lightens his work load or eases the stresses upon his patients. What does he do? Definitely he does not get a patent on his process or his technique. He is anxious to make his discovery available to all dentists and to all mankind. He prepares an article for publication in a dental journal. He knows that through the written word he can spread the message widely and that it will be recorded in a permanent form for other generations to read. The magazine that carries this article, THE DENTAL DIGEST for example, is circulated in virtually every country. There are no boundaries or barriers or tariff walls erected to restrain distribution. Dentists in the Soviet Union, in South America, in China, in Australia, read the article or a reprinted translation of it. They put the method to work. The people of these countries are benefited and given comfort.

This is what the late Walter B. Cannon, the eminent physiologist of Harvard, meant when he wrote in his own autobiography:[1] "The lives and achievements of scientists demonstrate how utterly fantastic is the notion of so-called 'nationalistic' science! . . . There could be no artificial barriers because the world-wide uniformity of scientific phenomena renders such barriers absurd. In a very real sense all who contribute in various lands to the advancement of science in any particular field are collaborators."

It is satisfying to have had the opportunity, as THE DENTAL DIGEST has had for fifty years, to aid the dentists of the world to collaborate one with the other. It is a real pleasure to have this current opportunity of publishing the techniques and procedures of our colleagues in the South American republics. The future gives us the responsibility to spread the advancements of dentistry among all mankind. The hope of a peaceful future lies in this kind of internationalism.

[1]Cannon, W. B.: The Way of an Investigator, ed. 1, New York, W. W. Norton & Company, Inc., 1945, page 48.

# *About Our Contributors*

*Guillermo A. Bizzozero, D.D.S.*

(School of Dentistry of the University of Buenos Aires, 1929) limits his practice almost entirely to prosthetic dentistry. Doctor Bizzozero teaches prosthetic dentistry in the School of Dental Technicians in Buenos Aires. He is the president of the Dental Prosthesis Society of Argentina, and was the first director (1937-1940) of the Argentine journal, *Prótesis*. Doctor Bizzozero, the special South American editor for this anniversary issue of the DIGEST, contributes an article on THE IMPORTANCE OF THE OVERJET IN FULL DENTURE CONSTRUCTION.

*Leopoldo Panatt W., D.D.S.*

(Dental School of the University of Chile, 1924) has been professor of dentistry in the Dental School since 1941. He has served three terms as president of the Dental Society of Chile. Doctor Panatt is the author of many articles on surgery and the treatment of fractures of the facial bones. He reports here the use of modified EXTRA-ORAL RETENTION SPLINTS in the treatment of mandibular fractures, and in the postoperative treatment of ankylosis of the temporomandibular joint and bone graft of the mandible.

*José María Quiroga, D.D.S.*

(The National University of Litoral, Santa Fé, 1932) is the present director of *Prótesis*, and was for eight years the director of the journal, *El Cooperador Dental*. He is the official clinician of the Argentine Dental Association and of the Dental Prosthesis Society of Argentina. Doctor Quiroga is the author of several scientific articles. His presentation is on the RESTORATION OF THE PLANE OF OCCLUSION AND THE VERTICAL DIMENSION.

*Ubaldo A. Caorsi, D.D.S.*

(School of Dentistry of the University of Buenos Aires, 1939), a member of the faculty of the School of Technicians at the University, was awarded the prize "Doctor Nicasio Etchepareborda" by the Faculty of Medical Sciences for his original research on the etiology of pathologic conditions of the tongue. Doctor Caorsi is the secretary of the Argentine journal, *Prótesis*. He describes A NEW RETRACTOR FOR ORAL SURGICAL PROCEDURES.

*Ricardo C. Guardo*

(D.D.S., 1929; M.D., 1942, University of Buenos Aires) was assistant director of *Prótesis* from 1937 to 1940. He is the president of the Society of Dento-Maxillary Surgery, and represents the associate dental professors in the Council of the Faculty of the University. Doctor Guardo has published numerous articles of a scientific nature in the South American professional journals. He discusses here the SURGICAL TREATMENT OF ORAL LESIONS RESULTING FROM PROSTHESES.

*Roberto Harguindeguy, D.D.S.*

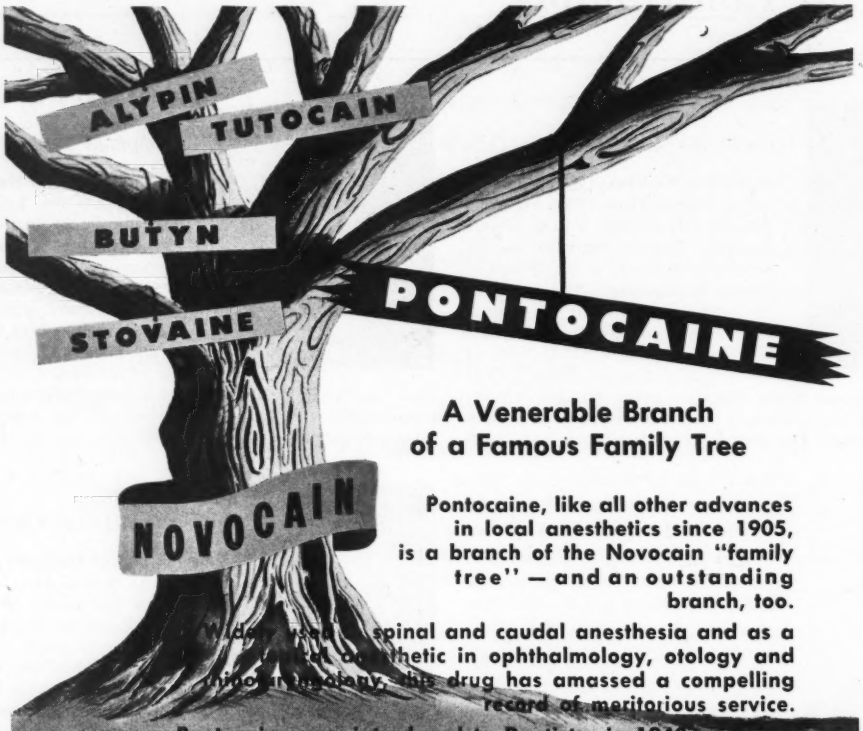
is associate professor of clinical prosthesis in the School of Dentistry of the University of Buenos Aires. He is on the executive committees of the Argentine Dental Association and the Dental Prosthesis Society of Argentina. Doctor Harguindeguy is managing editor of *Prótesis* and is on the editorial staff of *Gaceta Odontológica*. He has published numerous articles on prosthesis in South American journals, and writes for us on PARTIAL DENTURE PROSTHESIS (RESILIENCY IN ARTICULATION).

*Fernando E. Pinto, D.D.S.*

is the first associate professor and head of research in metallurgy and is director of the School of Dental Technicians in the School of Dentistry of the University of Buenos Aires. Doctor Pinto's scientific writings have been published in both South American scientific journals and those of other countries. His contribution to the DIGEST is A MODIFICATION OF THE PINLEDGE INLAY TECHNIQUE.

*Virgilio Moojen De Oliveira*

(D.D.S., 1925; M.D., 1937, University of Brazil) limits his practice to prosthodontia. Doctor Oliveira is professor of prosthesis in the National Dental School of the University of Brazil, and is president of the Dental Association of Brazil. He has published numerous articles in the dental literature. His article (see Editor's Note, page 622) is A FLEXIBLE REST IN THE REMOVABLE PARTIAL DENTURE.

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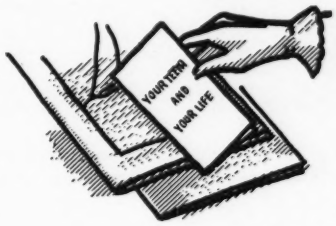


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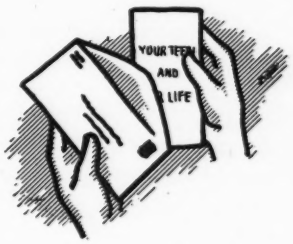


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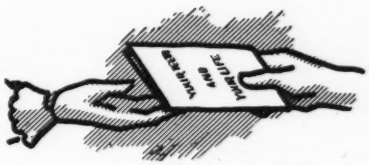

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## Sharpening of Excavators and Chisels

(*Continued from page* 630)

4. This method takes too long.

*Inconvenience of Sharpening on Rotating Stones*—1. Danger of wearing instrument too much.

2. Danger of softening steel by overheating.

*Method Suggested*—1. Vulcarbo separating disc:

a) Rigid.

b) Can be used with water.

2. Paper disc:

a) Easier to handle.

b) Adapts itself to curve.

3. Chisel, mounted stone, or disc:

a) Must have 45-degree angle with disc (Fig. 8).

b) The chisel must be absolutely flat (Fig. 9).

c) Disc must rotate toward the cutting edge (Fig. 10).

d) To prevent overheating and softening, operate under water.

4. Arkansas Stone:

a) This stone has a hard surface with crystals which bite into metal.

b) Oil is used to remove fine metal scrapings which otherwise would make the surface smooth and inefficient.

c) Clean the stone with cloth and clean oil or kerosene.

d) Pass the instruments lightly on all surfaces already sharpened by rotating stones.

5. Excavators:

a) One may use cuts in stone.

b) Then give a light stroke on the flat surface.

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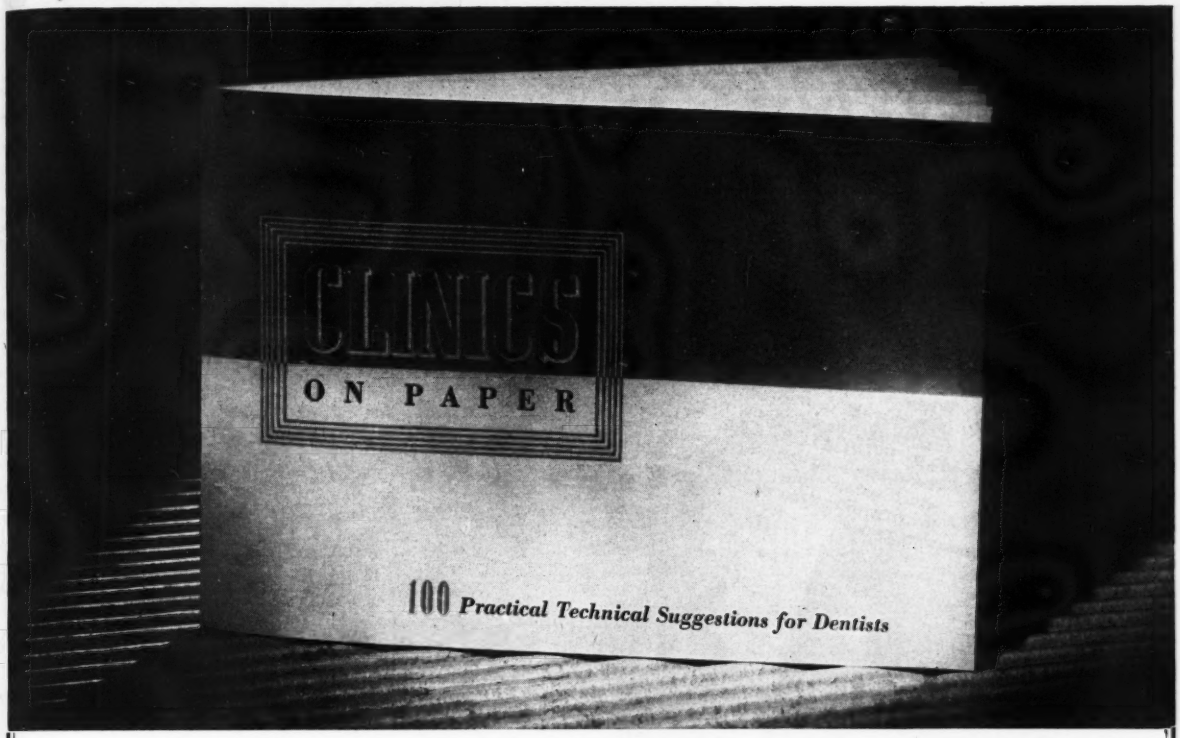


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# Contra-Angles

**Old Doc Brady Rides Again . . .**

The One-Man Encyclopedia of Medical Misinformation, William Brady, M.D., has given off another of his malodorous bits of advice. A distraught husband, worried over his wife's sore tongue, wrote as follows to Brady:

"Wife has had a sore tongue for last three years. Two doctors said it is due to allergy of some food, but did not know what food or foods. One said it is due to cigarettes (she is a moderate smoker). One said a ganglion (nerve ganglion) in the tongue must be exposed."

The Seer of the Newsprints, Brady, responded as follows:

"Possible explanation would be some new denture installed three years ago, of metal dissimilar to metal in other dentures, constituting a miniature galvanic battery setting up a current that burns the tongue. Remedy for that is change new denture to metal similar to old denture."

Here we see a case of a poor devil with a wife complaining of a sore tongue. She has received opinions that it is due to allergy, to smoking, and to something or other wrong with a nerve ganglion. Now Brady steps in and muddles up things by suggesting the theory of electrogalvanism! Nobody has said that the woman had a denture of any sort. Presumably she has some metallic restorations in her teeth; most people do. Of the millions of people who are going around with dissimilar metals in their mouths, few ever show any signs of a "miniature galvanic battery setting up a current that burns the tongue." If electrogalvanism had any important clinical significance, we would be a nation of people with crisp and toasted tongues. A few years ago we heard a lot

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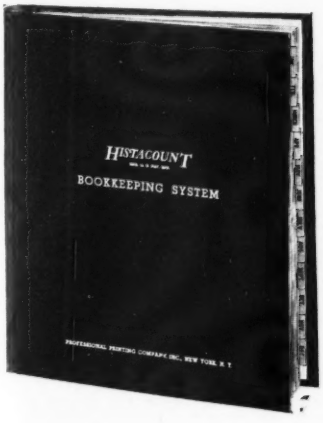


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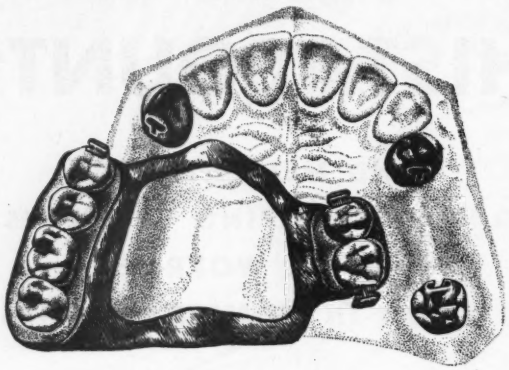
# BROWN PROXIMAL CONTACT ATTACHMENTS



**BROWN PRECISION ATTACHMENTS have been used successfully since 1920, when patents were granted to their inventor, Dr. I. Brown. This event followed by only a few years the publicity and impetus that Dr. Herman Chayes gave to the advance in removable restorations by the introduction of the precision type of attachment.**

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**The use of Precision Attachments is indicated in this case because they eliminate need of a cumbersome continuous clasp across anteriors from cuspid to 1st bicuspid, which would be required in a clasp case in addition to clasps on the three abutment teeth.**

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*If you have a doubtful case, send us the study casts in occlusion, and we shall be glad to write you the opinion of our professional consultant as to whether the use of Precision Attachments is indicated.*

*As makers of attachments, we are as anxious to discourage their use where contra-indicated as to encourage it where indicated.*

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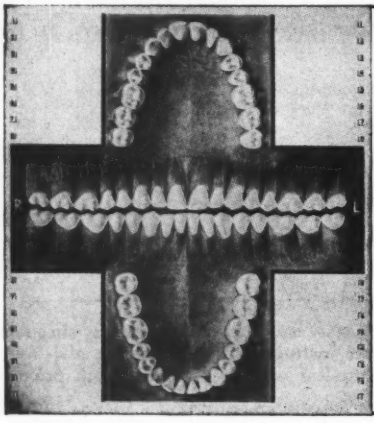

**Permanent Records Are Important . . .**

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about electrogalvanism as a cause of cancer of the tongue and the buccal mucous membrane. We have not heard much of that theory lately. Once in a while when dissimilar metals are in contact in the mouth, people complain of a metallic taste similar to the experience of striking a gold restoration with a table fork.

Brady probably is just getting around to his reading and is catching up on the literature of 1935 or thereabouts. If he would take the time to talk *to* one of the "dentors" that he used to talk *about*, he would find that electrogalvanism is more a phenomenon of the textbooks than it is a clinical entity. You notice in Brady's answer that he is talking about "dentures." It probably is news to him that individual tooth restorations may be metallic. I suspect that he does not know a denture from an inlay or any other individual tooth restoration.

### Bugs Need Food, Too . . .

It has been observed that people suffering from pellagra are relatively immune to dental caries. With this clue, an enterprising investigator fed some laboratory animals food that had been subjected to high heats. It was found that the group of animals that ate the sterilized foods were more immune to dental caries than the control group that had been given the food in its natural contaminated status. The implication is that even bacteria need vitamins to grow; but the pellagrin who is avitaminotic has, in fact, not enough foodstuff for even bacteria to become interested, hence his relative freedom from caries.

This may offer a clue to the high index of immunity to caries of many Asiatic peoples. Among these Asiatics there is widespread malnutrition according to our standards, but in the face of this inadequate diet, these people frequently have strong, well developed teeth and freedom from dental caries. If the whole organism requires vitamins and other chemical agents to sustain and fulfill life, it is easy enough to see how the lower or-

(*Continued on page* 653)

*Teeth that sparkle*

Polished with Warren-Teed Pumice Paste — a delightfully flavored dental abrasive paste — with an adhesive substance incorporated to minimize flying particles. For your patients' pleasure — and for your professional satisfaction — use Warren-Teed Pumice Paste.

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PUMICE PASTE

(*Continued from page* 648)

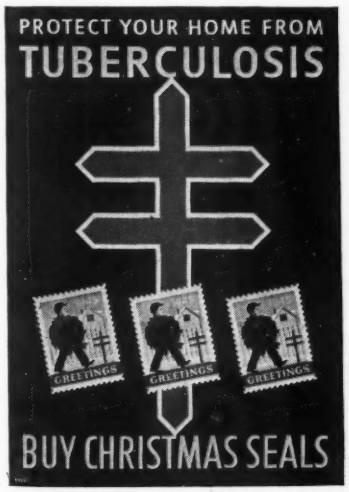
ganic forms, such as bacteria, likewise may require good foodstuffs. It is also easy to see how with better foods they can flourish and multiply and become more active.

**Don't Be Funny . . .**

A friend of this magazine writes to suggest that we do something about the cartoonists who are forever poking fun at dentists and dentistry. It is easy for us to become offended when something appears in the papers that might be degrading to dentistry or cast dentistry in a facetious light. We should remember, however, that the function of all cartoonists is to caricature life and to make situations and people appear ludicrous. The cartoonist is fundamentally a satirist who makes his living by deflating the ego of people. No one is immune from his darts. I think we have extremely shallow senses of humor if we get too excited about the caricatures that cartoonists may draw of dentists or dental practice.

**If We Would Strike, Too . . .**

With widespread strikes in the



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**STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS, OF AUGUST 24, 1912.**

Of The Dental Digest, published monthly at Pittsburgh, Pa., for October 1, 1945.

State of Pennsylvania,
County of Allegheny,
ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared M. B. Massol, who, having been duly sworn according to law, deposes and says that he is the Publisher of The Dental Digest, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher and editor, are: Editor, E. J. Ryan, B.S., D.D.S., 708 Church Street, Evanston, Ill.; Publisher, M. B. Massol, 1005 Liberty Ave., Pittsburgh, Pa.

2. That the owners are: Dental Digest, Inc., 1005 Liberty Ave., Pittsburgh, Pa.: Oral Hygiene, Inc., 1005 Liberty Ave., Pittsburgh, Pa.; M. B. Massol, 1005 Liberty Ave., Pittsburgh, Pa.; Louise A. Smith, Hotel Schenley, Pittsburgh, Pa.; Lynn A. Smith, 10 Robin Road, Pittsburgh, Pa.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company is trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stocks, bonds, or other securities than as so stated by him.

(Signed) M. B. MASSOL,
Publisher

Sworn to and subscribed before me this 29th day of September, 1945.

(Seal) Ruth B. Kost, Notary Public.
(My commission expires May 1, 1948.)

country and people demanding less time and more money, I wonder what would happen if dentists, physicians, and nurses suddenly decided to walk off the job, lay down their instruments, and set up picket lines. If that were to be done even for a day, a hue and cry would be raised that would shake the country. All the labor people and social scientists would be screaming for immediate government intervention and state medicine.

No one with any decency will object to workers organizing for collective bargaining. Unions came into being because there were too many selfish, grasping capitalists. The unions probably have overcompensated, however. They were created to correct an evil, the evil of insecure and underpaid employment. Now they have overcompensated to endanger the efficiency and the productivity of workers. Although dentists, physicians, and nurses are neither laborers nor capitalists, most of them have sprung from middle-class origins, the great majority most likely from families that are familiar with the dinner pail and long hours of servitude in a factory or on a farm. If labor insists on a 30 per cent increase in wages, we professional people likewise will have to demand an increase in our incomes.

The products of the mills and factories and the farms will be increased in price with the increase in wages. We will find that the working man with an increase in his money income has a decrease in his buying power. It does little good to have an income increase of 30 per cent and, running parallel with that, experience a 40 per cent increase in living expenses. There is no gain there. There is, in fact, a 10 per cent loss in purchasing power.

We in the medical professions feel a certain responsibility to the public that has given us a monopoly to practice. We feel that we should make an effort to serve all people who need our attention. We serve at any time of the day or night, on workdays, holidays, and Sundays. No responsible person would suggest that industry return to the sixty-hour week.

If people can make a living working forty hours, that is fine, but it should not be for the union man alone. If he wants a forty-hour week, then the professional people and the small businessmen and shopkeepers are entitled to a forty-hour week. With the shortage of dentists and physicians in the United States, a forty-hour week for us may produce some inconveniences for the people who need our services. It is unlikely that responsible professional people will ever go on strike, but it is quite possible that they will cut down their working hours and demand more income.—*E. J. R.*

### The Prevention of Recurrent Vincent's Infection

(*Continued from page* 634)

areas when the resistance of the patient is lowered. The zones are listed in the order of their importance:

a) Gingival flaps on lower third molars.

b) Lingual margins of interproximal gingivae of upper centrals associated with deep gingival sulci or periodontal pockets.

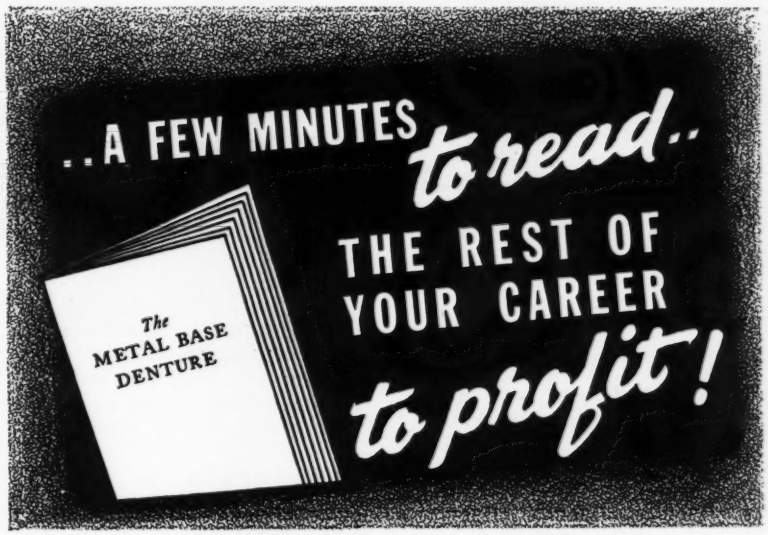
c) Buccogingival margins of upper second and third molars in crowded contact with the mucous membrane of the cheek.

d) Cryptic tonsils.

If any of these areas are present, they must be eradicated if recurrence of the disease is to be prevented. While the second of the foci named usually will respond to conservative treatment, the others must almost always be removed surgically.

6. One of the most important and least recognized pathologic conditions occurring after an attack of Vincent's infection is the saucer-shaped interproximal area. One variety has normally contoured bone, and the other usually is associated with chronic Vincent's and the bony contour is affected. In both types the architecture of the interproximal tissue is changed seriously so that food particles are not deflected during mastication. Food accumulates in the area and the saucer becomes deeper. If the bone is not affected, proper contour usually can be restored by packing and the faithful use of the interdental stimulator. In the second type, surgical intervention is necessary. Often only the facial rim of the saucer need be removed. In that case there is a slant from lingual to facial after healing has occurred. The bone may be removed with a fissure bur or a chisel. A surgical cement covers the cut area for at least a week after the operation. The postoperative treatment, after the pack is removed, consists of zinc chloride packs and interdental stimulation.

—From *The Bulletin of the U. S. Army Medical Department* 4:489 (October) 1945.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Then send for and read the booklet we shall be glad to mail you at your request. In it we believe you will find a logical and convincing answer to your "better denture" problem, and the key to all the benefits which that implies.

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## In your ORAL HYGIENE this month

# WHY DENTISTS' INCOME TAXES MAY BE TOO HIGH

How's your income tax? . . . You may be paying more than you have to. Harold J. Ashe says many dentists are overlooking allowable deductions. Read his article "Why Dentists' Income Taxes May be Too High" (page 1922) before you figure your 1945 tax.

★ ★ ★

Doctor S. S. Arnim speaks for all dentists when he asks for a National Institute of Dental Research, and funds for treatment of dental disease. His statement, made before a Senate Subcommittee, urges the passage of bills S.190 and S.1099, which would provide such funds. Doctor Arnim says, "It is my opinion that passage of these bills promises a potential return in health value far greater than our fondest hopes." . . . You will want to read the whole article—on page 1918 of the November issue of Oral Hygiene.

★ ★ ★

It works in Cuba! . . . Professor Duven Clough Corbitt tells his personal experiences as a member of a cooperative health association (*quinta*) in Havana. In his article "Dental Service in a Medical Cooperative Association," Professor Corbitt explains how a plan originated by Spanish immigrants some eighty years ago, is still working successfully (from both the patients' and the practitioners' viewpoints), and suggests that some similar plan might be the answer to our problem of health care here in the United States. You will find his article on page 1906.

★ ★ ★

"It Takes What to Make a Dentist?" . . . Doctor John W. Cooke gives the answer in an article you won't want to miss. (Page 1914)

★ ★ ★

Where are those altruistic plans that were being made at the beginning of the war, to help protect the practices of the dentists who were called to Service? . . . A dental officer, speaking for fellow officers, gives civilian dentists something to think about in his article "What I Want When I Resume Practice." It's not too late to do something *now* to stop what this officer calls "vicious propaganda" being circulated by civilian dentists to the detriment of the returning Service dentist. Turn to page 1910.

★ ★ ★

"Credit Rating and Financing of Dental Contracts," by Doctor Ellsworth A. Bruce, explains the methods and means by which dentists may guard against loss in extending credit to patients. You will find this article (page 1930) practical and helpful.

★ ★ ★

Do you have any instruments you don't use, and would like to donate to a worthy cause? The Medical and Surgical Relief Committee of America is asking for all sorts of instruments and supplies. Material sent to them will be repaired and reconditioned to prepare it for immediate use in areas where it is badly needed. Send all donations to the Committee at 420 Lexington Avenue, New York City. Full particulars on page 1934.

★ ★ ★

Which is your favorite department? . . . "Ask Oral Hygiene"? . . . "Dentists in the News"? . . . "So You Know Something About Dentistry!"? . . . "Dear Oral Hygiene"? . . . "Laffodontia"? . . . "Editorial Comment"? . . . "The Publisher's Corner"? . . . "Technique of the Month"? . . . You'll find them all waiting for you in November Oral Hygiene.

# *Acrylic Resin as an Implant for Correction of Facial Deformities*

**KENNETH W. PENHALE, D.D.S., M.D., Chicago**

IMPLANTS, foreign or otherwise, have their place in the reconstructive field of plastic surgery. In the past, the materials used as implants were chiefly bone or cartilage. Their use dates back to about 1861, when rib grafts were made to supply the skeletal framework of a reconstructed nose. Other materials that have been used include bovine cartilage, ear, rib, and septal (autogenous) cartilage and homocartilage, bone transplants of various kinds, and ivory.

### Acrylic Resin

1. Acrylic resin, a polymerized methylmethacrylate, is a synthetic material used widely in American dentistry since 1939. It is a stable, clear material slightly heavier than water. This material had its origin in Germany through the research efforts of Rohn in 1900.

2. The chemical nature and general properties of acrylic resin are well established. Its hardness can be compared with that of 24-carat gold. It undergoes no significant change when boiled. Acrylic resin has a water solubility of about 0.1 per cent when placed in distilled water for one week. Alcohol and ether have no visible effect on the material, although acetone and chloroform produce a noticeable softening.

3. Acrylic resin has a tensile strength of from 9,000 to 12,000 pounds per square inch. It will, however, soften when submitted to a temperature of about 200° F.

### Foreign Body Reaction

The question arises, Does this material produce any foreign body reaction when buried in living tissues? Davis, in his report on the use of acrylic resin as a helmet for protection against craniocerebral injuries,

# Will your patient keep you PROUD OF YOUR WORK?

It's a happy moment for the dentist *and* the patient when the final fitting of a beautiful set of dentures is completed. And it's an opportune moment for a parting bit of important advice about their proper care.

If you suggest POLIDENT cleaning, you may rest assured that your patient will be started on an *easier*—*safer*—and *better* way of keeping the dentures you have made in a condition in which you may take pride. POLIDENT *cleans without abrasion . . . dissolves* mucin and tarnish . . . *cleans* and *deodorizes* every crevice *quickly* and *safely*. And because POLIDENT eliminates excessive handling—it minimizes the danger of breaking or chipping.

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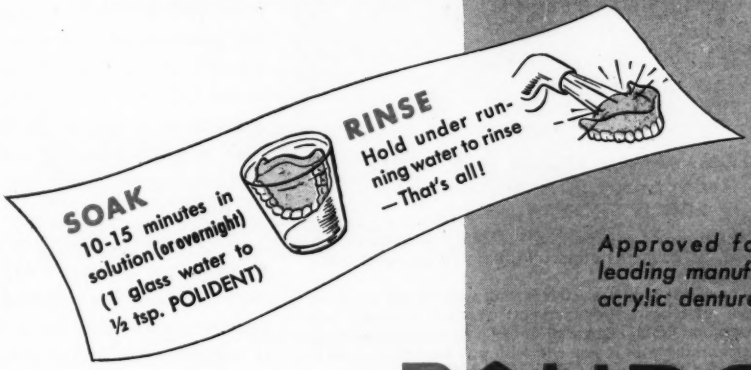


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Starting as a trickle, this movement has now become an appreciable stream.

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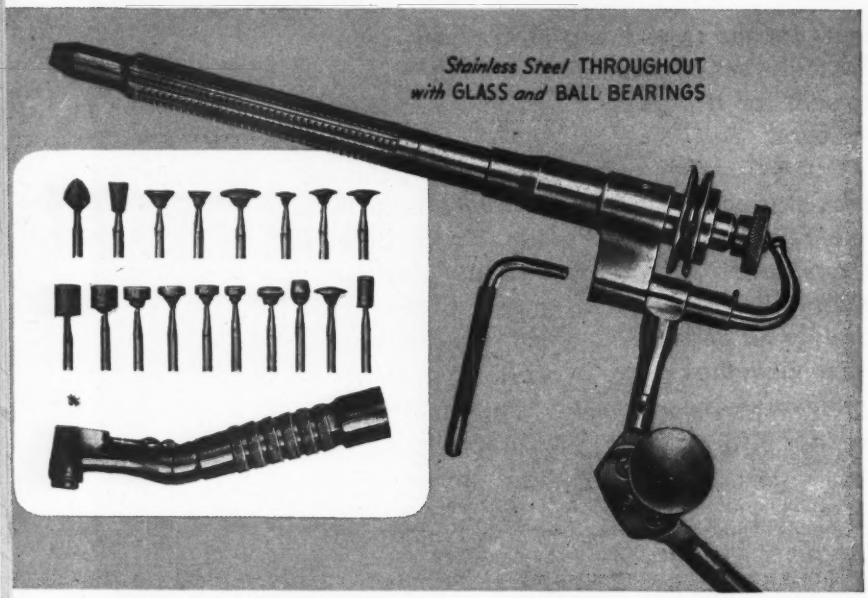


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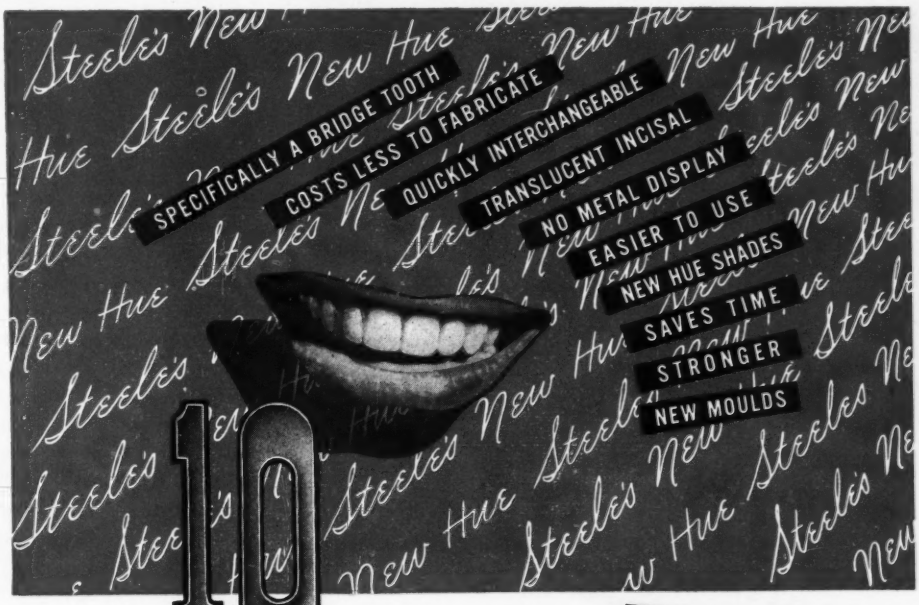
has stated that no serious tissue reaction occurred when such pieces were buried by accident in the brain or soft tissues.

Another question is, How does the reaction, if any, compare with the reaction set up when known satisfactory grafts are implanted? To answer this clinically as well as microscopically, pieces of known satisfactory grafts (autogenous ear cartilage, autogenous costal cartilage, ivory, and acrylic resin) were implanted under the skin of a monkey under careful aseptic conditions. These grafts, together with the surrounding tissue, were removed after seven days for microscopic examination. From this limited series of trials one can visualize the tissue reactions caused by the various known satisfactory implants and compare them with those caused by the acrylic resin. One might also conclude that acrylic resin produced less inflammatory infiltration in the early stages and yet a satisfactory fibrosis. In all grafts there was little change in the true skin, and this is especially true of the acrylic resin around which the fibrosis is confined to the immediate area of the implant.

### Preparing an Acrylic Implant

1. An impression is taken of the face, including all parts necessary to get proper proportions, with a colloid material or plaster of paris. The eyelashes and eyebrows are best covered with petrolatum, over which a flat piece of wet cotton is applied to prevent the material from adhering to the hair and getting into the eyes. The nasal cavity is packed lightly with a small mass of moist cotton around small tubes to facilitate breathing.

2. From the negative a positive is prepared of plaster, wax, Hominit, stone, or metal as desired. On this positive a wax mold (pink dental wax is satisfactory) of the defect is prepared. This mold is also tried to the defect itself. In the case of a saddle nose, the wax should be longer than the cast to allow compensation for the soft tissues over the globula of the nose. The under surface is con-




# REASONS FOR SPECIFYING STEELE'S NEW HUE *ANTERIOR* FACINGS

**STEELE'S NEW HUE ANTERIOR FACINGS have many distinctive advantages. Their porcelain incisal edge receives light instantly and diffuses it throughout the labial surface of the tooth. The molds for STEELE'S NEW HUE ANTERIOR FACINGS are new and especially designed for anterior bridgework. They minimize the distracting display of metal in interdental spaces. You'll prefer STEELE'S NEW HUE ANTERIOR FACINGS for anterior bridgework. *They harmonize better with the adjacent natural teeth.***

STEELE'S BICUSPID AND MOLAR FACINGS in NEW HUE Shades are now available at your dealer. STEELE'S BICUSPID AND MOLAR FACINGS in NEW HUE SHADES have the conventional flat back and are interchangeable with the regular STEELE'S BACKING.

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Practical porcelain incisal.
Moulds designed for bridgework.
Opacity at incisal eliminated.
Narrow interdental spaces.
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Natural highlights.
Harmony with adjacent teeth.
Interchangeable with Steele's New Hue Backings.
New Hue Shades.
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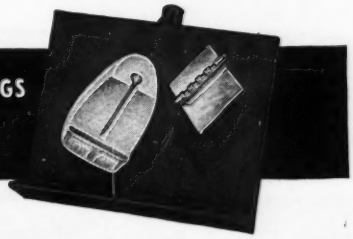

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cave and the lateral sides free from sharp edges. It can be molded by flame or softened in warm water. The wax pattern should be made slightly larger than is required; the size can be reduced easily by means of surgical burs. Perfect molding of the wax to a cast is not necessary, and often the mold is too small, as the implant is not to be inserted on the skin as the impression recorded. The general bony contour is noted, and the wax is prepared with the idea that it is to be inserted under the skin and subcutaneous tissues, not to be laid on the external visual defect.

3. The wax pattern is now ready to be reproduced in acrylic resin. This is done by investing the wax in plaster of paris in a metal flask, the flask separated, and the wax removed with boiling water. This leaves a mold in plaster the exact size and shape of the original wax pattern. The acrylic resin, purchased in the form of a powder and a liquid (usually methylmethacrylate), is mixed to form a doughlike mass. When this consistency is obtained, the material is packed firmly in the prepared mold slightly in excess and covered with cellophane or tin foil. The flask is closed, clamped, and placed in boiling water for one hour for polymerization. After boiling, it is allowed to cool and is separated. The soft, puttylike mass is now hard and can be removed in its entirety by cutting away the plaster.

4. Polishing is not too difficult. A large surgical bur is used to remove any excess. On the under surface many cone-shaped openings are made, but these should not extend through the material. The outer surface, especially of a nasal implant over which the skin is thin, is left smooth but not glazed.

5. The acrylic resin implant is now ready to be cleaned and sterilized. Green soap and a hand brush will remove all debris; cleaning should be done carefully, especially on the under surface where the holes are made. It is placed again into liquid soap and then immersed in boiling water for a few seconds, which is adequate sterilization. When removed from the

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boiling water, the implant is best kept or stored in a sterile wide-mouthed glass bottle. A satisfactory last minute sterilization can be done by merely removing the top of the bottle and pouring in sufficient 95 proof alcohol to cover the implant.

**Implanting the Acrylic Resin**

1. The surgical field is prepared as one would prepare it for the reception of any implant. A precaution worthy of mention is ligation of all bleeding vessels before the implant is made. The periosteum is not disturbed.

2. The cavity prepared, the implant is removed from the alcohol by means of a sterile tooth forceps and held in an ether bath for a few seconds. The forceps, still clasping the resin, is passed through air rather than dried with sterile gauze. After the implant has been placed in the position desired and the wound has been closed in the usual manner, a light, even pressure bandage should be applied. Petrolatum gauze over the skin and moist cotton usually will suffice.

3. After twenty-four hours the bandage should be removed and the graft palpated to determine whether it has remained in proper position. If not, it is possible to manipulate it slightly. A gentle pressure bandage should be reapplied and changed when necessary for five to six days.

4. Clinical observations of the skin are surprisingly gratifying. Little redness is seen, especially when small grafts are implanted. It is known that some persons (a small percentage) are allergic to acrylic resins worn as a denture. For this reason it is necessary to prepare the patient for such a possibility. One could test the patient for such a reaction before the operation, but in my experience no reactions have occurred after the implantation. From my observation, there is less cutaneous reaction with acrylic resin than with cartilage, especially homogeneous cartilage.

**Precaution**

It is advisable to instruct patients before and after operation that such implants may produce inflammatory changes at some future date. In the event that such noticeable reactions occur, they are advised to have the grafts removed. In my limited experience with this material for about three years, no person has had any untoward clinical effects. Not until such an implant has been embedded for ten or twenty years is one prepared to state its final outcome. Further investigation is warranted, as there are unlimited possibilities for use of this material in reconstructive surgery. It may be advisable to bury metal in the acrylic resin implant, so that in case of future traumatic injuries the graft will be radiopaque to roentgen rays.

—From *Archives of Surgery* 50:233-239 (May) 1945.

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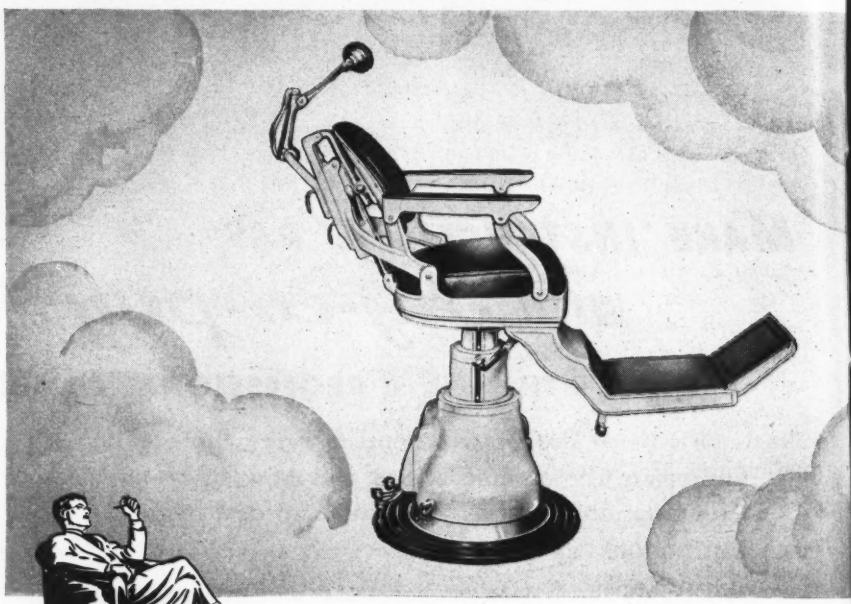

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# *Significance of Dental Caries in Malocclusion*

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### Causes of Malocclusion

The most pernicious of the etiologic factors which promote the abnormalities of occlusion is the early loss of both deciduous and permanent teeth. When a tooth is prematurely lost there is a tendency for those teeth back of the lost member to move forward. The result of this forward drifting produces a loss of normal cusp relationship between the opposing arches. This drifting also occurs, to a lesser degree, when the contacts are lost by caries.

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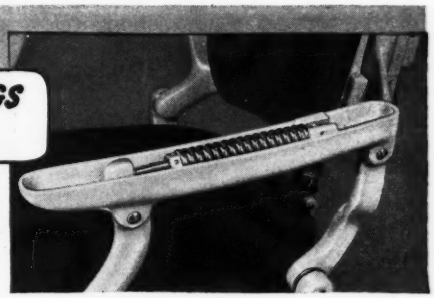

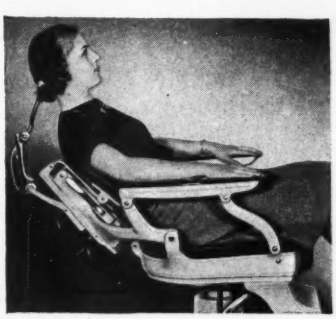

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ity of the dental arch, such as the loss of contacts or loss of a tooth, eliminate a growth stimulus that is needed to produce perfect balance in tooth and arch relationship.

One of the greatest forces influencing the growth of the face is the forward drive created when the teeth come into function. The angle of the upper teeth is slightly forward and downward—the angle of the lower is forward and upward. This is more particularly true in the molars; thus when the posterior teeth come into function, there is a resultant forward drive. This forward drive is an important factor in stimulating the forward growth of the dental arches.

One other mechanism that comes into play here is the restraining force of the facial musculature. Primarily the orbicularis oris, buccinator, and associated muscles make up this restraining force.

It should be pointed out that the critical period in a child's development comes during the time between the eruption of the first molars and the third molars. During that period it is imperative that the integrity of the dental arch be maintained lest mutilated arches result with subsequent occlusal anomalies. This condition may come about by the premature loss of tooth material in any manner. Just as soon as a part of the tooth, such as the early caries of the proximating surfaces, occurs, the two forces produce a squeeze. The result will be a shortening of the dental arch.

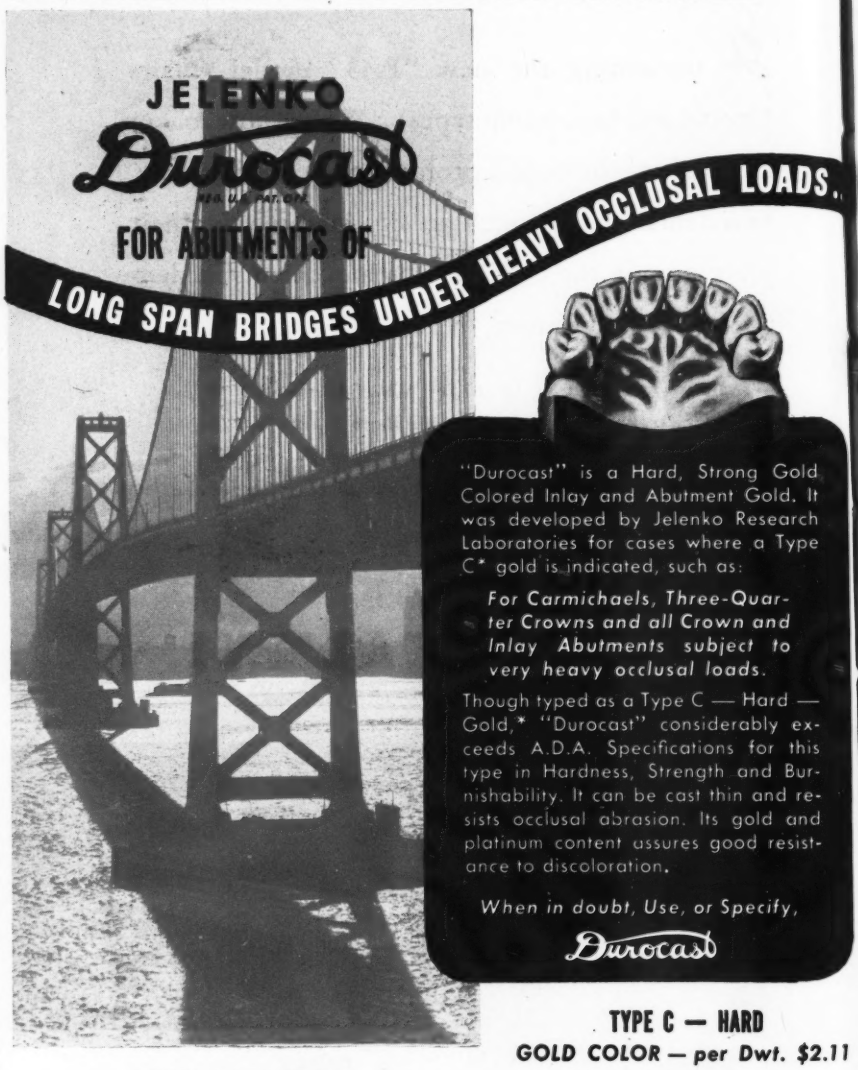
In 1933 Willitt surveyed 1,000 cases of malocclusion. He stated "that 8.4 per cent of the malocclusions could be attributed to the premature loss of deciduous teeth in whole or in part." This study included children up to ten years of age. That percentage is great enough, and if studies were carried to higher age levels it might run even higher, because when normal growth factors become perverted their influence might be felt up to the complete eruption of the second molars. Shortening the length of the dental arch or arches obviously will throw the occlusion out of balance and impair normal function.

## Caries and Malocclusion

In the surveys made by the fluorine committees of the Wisconsin State Dental Society in conjunction with the Dane County Dental Society for the purpose of determining the effect of caries upon occlusal irregularities, some startling figures were obtained. The following two areas having drinking water of known fluorine content were selected: Union Grove, fluorine content of 1 part per million of water by volume; and Madison, fluorine content of 1/20 of 1 part per million of water. Children between the ages of twelve and seventeen, inclusive, were examined for the purpose of orthodontic comparisons.

*Conclusions*—There was 40 per cent normal mesiodistal relationship in Union Grove against 12 per cent in Madison—over 3 to 1, which seems to indicate clearly that the lack of disturbance by caries has allowed the teeth to erupt into more nearly normal mesiodistal relation.

Compare these figures with caries incidence in the same groups. Madi-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son children have *three* times as many cavities and *three* times the number of malocclusions as Union Grove children; furthermore, the irregularities present among the Union Grove children seemed to be less extreme. Many were unilateral; however, they were classed as malocclusions.

It is evident that caries is an important factor in the etiology of malocclusion. These figures support the contention that there is less malocclusion in Union Grove because there is less loss of tooth structure by caries.

Since all other conditions were essentially the same in Madison and Union Grove, and since many other surveys indicate that the fluoride content of water is the inhibitor of dental caries, it can be presumed that here too fluorine is the inhibiting factor of malocclusion by inhibiting dental caries.

—From *The Journal of the Wisconsin State Dental Society* 21:104-106 (September-October) 1945.

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